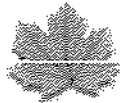


**EPA Registration Jacket**  
**70506-230**

# ISB'S Front-end PRIA Completeness Screen

Draft 3; 10/25/07

EPA Receipt Date: <b>DEC 22 2009</b>		EPA Reg. Number: <b>70506-EG</b>		
	Check List Item	Yes	No	N
1	Has the <b>PRIA Fee</b> been Paid; is a copy of the check or Pay.gov receipt included in the Submission Package?	X		
2	Is an <b>Application Form</b> (EPA Form 8570-1) Included in the Submission Package, is it completely filled out and signed including package type?	X		
3	Is a <b>Confidential Statement of Formula</b> (EPA Form 8570-29) Included in the Submission Package, is it completely filled out and signed (boxes 1-21)?	X		
4	Is a <b>Formulator's Exemption Statement</b> (EPA Form 8570-27) Included in the Submission Package?		X	
5	Is a <b>Certification with Respect to Citation of Data</b> (EPA Form 8570-34) Included in the Submission Package?	X		
6	Is a <b>Data Matrix</b> (EPA Form 8570-35) Included in the Submission Package?	X		
7	Is a <b>Label</b> Included in the Submission Package?	X		
8	Are <b>Data</b> Included in the Submission Package?	X		
9	Is the Submission an Amendment?		X	



**Pendimethalin Technical, EPA Reg. No. 70506-EEO - List of deficiencies**

Philip Errico to: tim.formella

06/30/2010 03:21 PM

Cc: Jim Tompkins, Dan Kenny

Tim,

Per our conversation this morning, we are unable to register your requested product, Pendimethalin due to the impurity we spoke about on the phone being higher than 1ppm.

The other product chemistry deficiencies are:

1. One of the toxic solvents we spoke about was noted as one solvent in one part of product chemistry report and a different solvent in another part of the report. Please clarify.
2. Include the concentration of the correct solvent on CSF, as it was only partially recovered.
3. The preliminary analysis indicates all samples were negative for the nitrosoamines tested, except for the one discussed on the phone. While it is not required, you can include the results of the N.D. analyses on the CSF, if you wish.
4. Provide additional data to clarify the methodology used for the quantification of the impurities.
5. Provide the Subgroup B product chemistry guideline requirements for 830.6314, 830.6315, and 830.6316, Oxidation Reduction/chemical incompatibility, flammability and explosability, which were incorrectly identified by you as not required by technical chemicals.
6. The proposed label must be modified to read, "if burned, stay out smoke."
7. Once registered, samples (required under Guideline 830.1900) and a copy of the analytical enforcement method must be provided to the EPA Analytical Lab, 701 Mapes Rd., Ft. Mead, MD 20755-5350.

The URL site for the product chemistry SOP relating to the maximum concentration of nitrosoamines in pesticide products is <http://www.epa.gov/oppfead1/guidance/product-sop.htm>, and see XII(2)d.

Regards,

Philip (Phil) V. Errico, Senior Chemist  
U. S. Environmental Protection Agency  
Office of Pesticide Programs  
Registration Division/Herbicide Branch (7505C)  
Phone: 703-305-6663  
Fax: 703-308-1825  
Email: Errico.Philip@epa.gov



U.S. ENVIRONMENTAL PROTECTION AGENCY

Office of Pesticide Programs  
Registration Division (7505P)  
1200 Pennsylvania Ave., N.W.  
Washington, D.C. 20460

EPA Reg. Number:

70506-230

Date of Issuance:

JUL 12 2010

NOTICE OF PESTICIDE:

☒ Registration  
☐ Reregistration  
(under FIFRA, as amended)

Term of Issuance:

Unconditional

Name of Pesticide Product:

UP-END HERBICIDE

Name and Address of Registrant (include ZIP Code):

United Phosphorus, Inc.  
630 Freedom Business Center, Suite 402  
King of Prussia, PA 19406

Note: Changes in labeling differing in substance from that accepted in connection with this registration must be submitted to and accepted by the Registration Division prior to use of the label in commerce. In any correspondence on this product always refer to the above EPA registration number.

On the basis of information furnished by the registrant, the above named pesticide is hereby registered/reregistered under the Federal Insecticide, Fungicide and Rodenticide Act. Registration is in no way to be construed as an endorsement or recommendation of this product by the Agency. In order to protect health and the environment, the Administrator, on his motion, may at any time suspend or cancel the registration of a pesticide in accordance with the Act. The acceptance of any name in connection with the registration of a product under this Act is not to be construed as giving the registrant a right to exclusive use of the name or to its use if it has been covered by others.

This product is unconditionally registered in accordance with FIFRA section 3(c)(5) provided that you:

1. Submit and/or cite all data required for registration of your product under FIFRA sec 3(c)(5) when the Agency requires all registrants of similar products to submit such data; and submit acceptable responses required for registration review of your product under FIFRA section 3(g).
2. Within 1 year of the date of this Notice, submit the following data:
  - 830.6317 (one year storage stability) and 830.6320 (corrosion characteristics). The observations must be made at 0, 3, 6, 9, & 12 month intervals. These studies must be conducted under the full GLP requirements in compliance with 40CFR§160

Signature of Approving Official:

James A. Tompkins, Product Manager (25)  
Herbicide Branch, Registration Division (7505P)

Date:

JUL 12 2010

3. Make the following changes to the label:

- a. Change the product registration number to "EPA Reg. No. 70506-230".
- b. Add the batch number to all products in disposable containers before shipment.
- c. On page 3, change the word, "General" in "General Information," to "Product."
- d. On page 3, amend the words, "Examples of such sites include, but are not limited to..." to read, "Such sites include: grounds or lawns.....and sod farms."
- e. On page 3, remove the word, "General" in "General grounds maintenance."
- f. On page 20, under "CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY", second paragraph, add "TO THE EXTENT CONSISTENT WITH APPLICABLE LAW," to the beginning of the 3rd sentence starting with "All such risks, etc."

4. A stamped accepted label with comments is enclosed for your files.

5. Submit one copy of the revised final printed label for the record before the product is released for shipment.

If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6(e). Your release for shipment of the product constitutes acceptance of these conditions.

Please contact Phil Errico at 703-305-6663/ [errico.philip@epa.com](mailto:errico.philip@epa.com) .

Enclosure: Label stamped "Accepted with Comments"

document3

# UP-End Herbicide

**For Preemergent Weed Control in Turfgrasses, Landscape or  
Grounds Maintenance, Noncropland Areas and Ornamental Production**

## ACTIVE INGREDIENT

pendimethalin, N-(1-ethylpropyl)-3,4-dimethyl-2, 6-dinitrobenzenamine ..... 38.7%

**OTHER INGREDIENTS:** ..... 61.3%

**TOTAL** ..... 100.0%

(1 gallon contains 3.8 lbs. of microencapsulated pendimethalin in an aqueous carrier.)

**ACCEPTED**  
with **COMMENTS**  
In EPA Letter Dated:

JUL 12 2010

Under the Federal Insecticide,  
Fungicide, and Rodenticide Act  
as amended, for the pesticide  
registered under EPA Reg. No.

70506-230

## KEEP OUT OF REACH OF CHILDREN CAUTION/PRECAUCIÓN

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.  
(If you do not understand the label, find someone to explain it to you in detail.)

FIRST AID	
If in eyes	<ul style="list-style-type: none"> <li>• Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li> <li>• Remove contact lenses, if present, after first 5 minutes, then continue rinsing eye.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
Have the product container or label with you when calling a poison control center or doctor or going for treatment. For medical treatment, call the Rocky Mountain Poison Control Center at 1-866-673-6671.	

**FOR CHEMICAL EMERGENCY:** Spill, leak, fire, exposure, or accident,  
call CHEMTREC 1-800-424-9300.



United Phosphorus, Inc  
630 Freedom Business Center, Suite 402  
King of Prussia, PA 19406  
1-800-247-1557 • [www.upi-usa.com](http://www.upi-usa.com)

EPA Reg. No. 70506-  
EPA Est. No.

Net Contents



## PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS

### CAUTION

Causes moderate eye irritation. Harmful if absorbed through skin. Avoid contact with skin, eyes or clothing.

#### Personal Protective Equipment (PPE):

Some materials that are chemically resistant to these products are listed below. For more options, refer to Category A on an EPA chemical resistance category selection chart.

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves made of any waterproof material such as nitrile, butyl, neoprene, and/or barrier laminate
- Shoes plus socks

Follow manufacturer's instruction for cleaning and maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

#### ENGINEERING CONTROLS

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR 170.240)(d)(4-6), the handler PPE requirements may be reduced or modified as specified in the WPS.

#### USER SAFETY RECOMMENDATIONS

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

#### ENVIRONMENTAL HAZARDS

This product is toxic to fish. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in adjacent aquatic sites. Do not contaminate water when disposing of equipment washwaters or rinsate.

#### DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling. This labeling must be in the possession of the user at time of herbicide application.

Do not apply this product through any type of irrigation system.

UPI does not authorize the use of this product in manufacturing, processing or preparing custom blends with other products for application to turf or ornamentals.

Do not apply this product in a way that will contact workers or other persons either directly or through drift. Only protected handlers may be in the area during application.

For requirements specific to your state or tribe, consult the state or tribal agency responsible for pesticide regulation.

Do not apply UP-END herbicide in greenhouses, shadehouses or other enclosed structures.

Not for use for commercial seed production.

### AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 24 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Chemical-resistant gloves made of any waterproof material such as nitrile, butyl, neoprene, and/or barrier laminate
- Shoes plus socks

### NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Do not enter treated areas without protective clothing until sprays have dried.

**FAILURE TO FOLLOW THE DIRECTIONS FOR USE AND PRECAUTIONS ON THIS LABEL MAY RESULT IN POOR WEED CONTROL OR CROP INJURY.**

### MODE OF ACTION

UP-End is a meristematic inhibitor that interferes with the plant cellular division or mitosis and cell elongation in the growing points of shoots and roots of susceptible weeds. When susceptible weeds germinate in the treated area, they contact the herbicide and both shoot and root growth stops. Translocation of the herbicide within the plant is limited. Affected weeds die shortly after growth is stopped, usually before emergence from the soil.

### GENERAL INFORMATION

**APPLICATION USE SITES** – for preemergence control of grasses and certain broadleaf weed species as they germinate.

**Turfgrass sites** (golf course, lawns, sod farms and other turf areas) and landscape ornamental maintenance areas. Examples of such sites include, but are not limited to: grounds or lawns around residential and commercial establishments, multifamily dwellings, military and other institutions, parks, airports, roadsides, schools, picnic grounds, athletic fields, houses of worship, cemeteries, golf courses, prairie grass areas and sod farms.

**General grounds maintenance** in areas such as parking lots, driveways and roadsides, alleyways, bike and jogging paths, vacant lots, buildings, stone gardens and gravel yards, markers and fence lines, and mulch beds. It may be used under asphalt or concrete treatments as part of a site preparation program.

**Noncropland areas** such as railroad, utility, highway, and pipeline rights-of-way, highway guardrails, delineators, and sign posts, bridge abutments and approaches, utility substations, petroleum tank farms, pumping installations, storage areas, fence rows, windbreaks and shelterbelts, paved or gravel surfaces, and established wildflower plantings where weed control is desired.

**Bulb plantings, non-bearing fruit and nut tree nurseries, conifer and hardwood seedling nurseries and tree plantations** for site preparation and maintenance. Applications can be made on, but are not limited to, plant species listed on this label such as trees, shrubs, groundcovers, perennials, bulbs, ornamental grasses and bedding plants.

**In and around field, liner and container ornamental production.**

### APPLICATION INSTRUCTIONS



UP-End will not control established weeds. Therefore, areas to be treated should be free of established weeds at the time of treatment, or use UP-End together with herbicides registered for postemergence use in managed turf sites, landscape ornamentals and in other noncropland areas. Consult the labels of those herbicides for suggested treatments, rates to be used and precautions or restrictions for use in these areas. The efficacy of UP-End will be best if the application is followed by one-half inch of rainfall or its equivalent in sprinkler irrigation. If UP-End is not activated by rainfall or irrigation within 30 days, weed control may be erratic.

When applied according to label directions and under normal growing conditions, UP-End or UP-End tank-mix combinations will not cause crop injury. Over-application can cause crop stand loss, crop injury, or soil residues. Uneven application can decrease weed control or cause crop injury.

Seedling diseases, cold weather, excessive moisture, high soil pH, high soil salt concentration, or drought can weaken seedlings and plants, and increase the possibility of plant damage from UP-End.

## MIXING INSTRUCTIONS

UP-End may be applied in a tank mix or a sequential application with other herbicides registered for use in a given crop. Refer to the companion label for weeds controlled in addition to UP-End alone.

When using tank mixtures or sequential applications with UP-End, always read the companion product label(s) to determine the specific use rates by soil types, weed species, and weed or crop growth stage. In addition, follow all precautions and restrictions including state and local use restrictions that may apply to specific products. Always follow the most restrictive label.

### Mixing Instructions

1. Fill tank 1/2 to 3/4 full with clean water or liquid fertilizer and agitate. Before mixing UP-End or UP-End tank mixtures in liquid fertilizer, refer to appropriate label sections for recommended uses in liquid fertilizer, application instructions, and compatibility determinations.

### 2. UP-End

When using UP-End alone, add UP-End to the partially filled tank while agitating and then fill the remainder of the tank with water or liquid fertilizer.

### 3. UP-End Tank Mixes

Add the tank mixture ingredients in the order listed below before adding UP-End:

- (a) **Wettable Powder (WP)** formulations - make a slurry of the WP in water (1:2 ratio). Add the slurry slowly into the partially filled tank while agitating.
- (b) **Dry Flowable (DF)/Water Dispersible Granule (WDG)** formulations - add the granules to the partially filled tank while agitating. Make a slurry of the granules in water before adding to liquid fertilizer.
- (c) **Flowable (F)** formulations - add the F formulation to the partially filled tank while agitating.
- (d) Add UP-End to the partially filled tank while agitating.
- (e) **Water Soluble Concentrate (WSC)** formulations - add the WSC formulation to the partially filled tank while agitating.
- (f) **Emulsifiable Concentrate (EC)** formulations - add the EC formulation to the partially filled tank while agitating.

Fill the remainder of the tank with water or liquid fertilizer while agitating.

4. Maintain continuous agitation while adding herbicides and until spraying is completed. If the spray mixture is allowed to settle for any period of time, agitate thoroughly to resuspend the mixture before spraying is resumed.

## 5. BACKPACK SPRAYER

Begin with a clean spray tank. Fill the spray tank one-half full with clean water and add the required amount of UP-End. Cap sprayer and agitate to ensure mixing. Uncap sprayer and finish filling tank to desired level. Cap sprayer and agitate again. During application it is desirable to agitate the mixture on occasion to ensure mixing. If the spray mixture is allowed to settle for any period of time, agitate thoroughly before spraying is resumed.

## 6. LIQUID FERTILIZERS

Before mixing, always test small quantities using a simple jar test. Add the required amount of UP-End to a half filled spray tank while agitating; then add the fertilizer product. Complete filling spray tank to desired level.

## SPRAYING INSTRUCTIONS

### GROUND APPLICATIONS

Apply with properly calibrated ground equipment in sufficient water per acre to uniformly treat the area, using a spray pressure of 25 to 50 psi. Suggested spray volumes are 20 - 200 gpa for professional turfgrass, landscape and ornamental applications and 10-200 gpa for all other noncrop applications such as roadsides, utility rights-of-way or soft-residual bareground applications. Maintain continuous agitation during spraying with good mechanical or bypass agitation. Avoid overlaps that will increase rates above those listed. Do not apply when winds may cause drift.

Avoid contact of spray solution with driveways, stone, wood, or other porous surfaces. If contact occurs, rinse immediately with water to avoid staining. Do not mechanically scrub until the surface area is thoroughly rinsed. Allow treated turfgrass to dry before entering to avoid staining onto non-treated surfaces.

#### **AERIAL APPLICATIONS**

Apply uniformly in 5 or more gallons of water per acre. Take care to minimize drift. Do not apply during periods of gusty winds or when wind conditions favor drifting. Spray drift can cause injury to sensitive crops. To avoid overlapping and possible crop injury, use a flagman or an automatic mechanical flagging unit on the aircraft.

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment- and weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions. The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to agricultural field crops:

1. The distance of the outermost nozzles on the boom must not exceed  $\frac{3}{4}$  the length of the wingspan or rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.

Observe more stringent state regulations. The applicator must be familiar with and take into account the information covered in the Aerial Drift Reduction Advisory Information presented below.

#### **INFORMATION ON DROPLET SIZE:**

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see **WIND**, **TEMPERATURE AND HUMIDITY**, and **TEMPERATURE INVERSIONS**).

#### **CONTROLLING DROPLET SIZE**

- Volume - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- Pressure - Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- Number of Nozzles - Use the minimum number of nozzles that provide uniform coverage.
- Nozzle Orientation - Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is recommended practice. Significant deflection from the horizontal will reduce droplet size and increase drift potential.
- Nozzle Type - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using lowdrift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

#### **BOOM LENGTH**

For some use patterns, reducing the effective boom length to less than  $\frac{3}{4}$  of the wingspan or rotor length may further reduce drift without reducing swath width.

#### **APPLICATION HEIGHT**

Do not apply at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

#### **SWATH ADJUSTMENT**

When applications are made with a crosswind, the swath will be displaced downward. Therefore, on the upwind and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the

aircraft upwind. Increase swath adjustment distance with increasing drift potential (higher wind, smaller droplets, etc.).

#### **WIND**

Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Do not apply when wind is below 2 mph due to variable wind direction and high inversion potential. **NOTE:** Local terrain can influence wind patterns. Every applicator must be familiar with local wind patterns and how they affect spray drift.

#### **TEMPERATURE AND HUMIDITY**

When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

#### **TEMPERATURE INVERSIONS**

Do not apply during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

#### **SENSITIVE AREAS**

Apply the pesticide only when the potential for drift to adjacent sensitive areas (e.g. residential areas, bodies of water, known habitat for threatened or endangered species, or non-target crops) is minimal (e.g. when wind is blowing away from the sensitive areas).

**Table 1. RESIDENTIAL , GOLF COURSE , COMMERCIAL AND OTHER NON-RESIDENTIAL TURFGRASS USES****Application Rates For Preemergence Weed Control**

UP-END herbicide <sup>1</sup>				
Turfgrass Species	Weeds	fl. oz.	pints	Comments
		Product per 1,000 sq.ft.	Product per acre	
COOL SEASON GRASSES				
Bluegrass, Kentucky Fescue, Fine Fescue, Tall Ryegrass, Perennial	Barnyardgrass Crabgrass Evening Primrose Fall Panicum Foxtail Hop Clover Knotweed Oxalis <i>Poa annua</i> Prostrate Spurge Purslane	All Turf Uses:		Make a repeat application of 2.2 to 3.1 pints/A (0.86 to 1.1 oz/1000 sq. ft.) after 5-8 weeks for extended control or where heavy weed infestations are expected.
		1.1 to 1.6 fl oz	3.1 to 4.2 pints	
		Initial application before weed germination in spring.		
	Goosegrass	Residential and Sod Farm Turf Uses Only <sup>2</sup> :		Make a repeat application of 3.1 pints/Acre (1.1 oz/1000 sq. ft.) if the lower rate was used initially or for extended goosegrass control after 5-8 weeks.
		1.1 to 1.6 fl oz	3.1 to 4.2 pints	
		Golf Course, Commercial and Other Non-Residential Turf Uses Only:		
		1.1 to 2.3 oz	3.1 to 6.3 pints	
		Initial application before weed germination in spring.		
	Chickweed Corn Speedwell Cudweed Henbit Lawn Burweed <i>Poa annua</i>	All Turf Uses:		Apply in late summer or early fall before weed germination. Apply a repeat application of 3.1 to 4.2 pints (1.1 to 1.6 oz/1,000 sq. ft.) after 5-8 weeks for extended <i>Poa annua</i> control.
		1.1 to 1.6 fl oz	3.1 to 4.2 pints	
	Bentgrass or established <i>Poa annua</i> <sup>3</sup> (1/2 inch height or taller)	Barnyardgrass Crabgrass Evening Primrose Fall Panicum Foxtail Hop Clover Knotweed <i>Poa annua</i> Oxalis Prostrate Spurge Purslane	All Turf Uses (Non-Greens and Tees):	
1.1 fl oz			3.1 pints	
Initial application before weed germination in spring.				
Goosegrass		All Turf Uses (Non-Greens and Tees):		Apply a repeat application of 3.1 pints/Acre (1.1 oz/1000 sq. ft.) for extended goosegrass control after 5-8 weeks.
		1.1 fl oz	3.1 pints	
		Initial application before weed germination in spring.		
Chickweed Corn Speedwell Cudweed Henbit Lawn Burweed <i>Poa annua</i>		All Turf Uses (Non-Greens and Tees):		Apply in late summer or early fall before weed germination.
		1.1 to 1.6 fl oz	3.1 to 4.2 pints	

UP-END herbicide <sup>1</sup>				
Turfgrass Species	Weeds	fl. oz.	pints	Comments
		Product per 1,000 sq.ft.	Product per acre	
<b>WARM SEASON GRASSES</b>				
Bahia grass Bermudagrass Buffalograss Centipedegrass Fescue, Tall <i>Paspalum</i> , seashore St. Augustine grass Zoysiagrass	Barnyardgrass Crabgrass Evening Primrose Fall Panicum Foxtail Hop Clover Knotweed <i>Poa annua</i> Oxalis Prostrate Spurge Purslane	Residential and Sod Farm Turf Uses Only:		Make a repeat application of 2.2 to 3.1 pints/Acre (0.86 to 1.1 oz/1000 sq. ft.) after 5-8 weeks if necessary.
		1.1 to 1.6 fl oz	3.1 to 4.2 pints	
		Golf Course, Commercial and Other Non-Residential Turf Uses Only:		
		1.1 to 2.3 fl oz	3.1 to 6.3 pints	
		Initial application before weed germination in spring.		
		Goosegrass	All Turf Uses (Non-Greens and Tees):	
	1.1 fl oz		3.1 pints	
	Apply before weed germination in spring. Make a second application at 3.1 pints (1.1 oz/1000 sq.ft.) 5-8 weeks later.			
	Chickweed Corn Speedwell Cudweed Henbit Lawn Burweed <i>Poa annua</i>	All Turf Uses:		Apply in late summer or early fall before weed germination. Make a repeat application of 3.1 to 4.2 pints (1.1 to 1.6 oz/1,000 sq. ft.) 5-8 weeks for extended <i>Poa annua</i> control.
		1.1 to 1.6 fl oz	3.1 to 4.2 pints	

<sup>1</sup> Do not use more than 4.2 pints (2.1 quarts) per acre per application on residential and sod farm turfgrass. Do not use more than 6.3 pints (3.1 quarts) per acre per application on golf course turfgrass, commercial or other non-residential turfgrass.

<sup>2</sup> Residential is defined as turf in any residential situation as well as home lawns, schools, parks and playgrounds.

<sup>3</sup> Not for use on bentgrass or *Poa annua* greens or tees.

The efficacy of UP-End is best if the application is followed by one-half inch of rainfall or its equivalent in sprinkler irrigation. If UP-End is not activated by rainfall or irrigation within 30 days, weed control may be erratic.

To prevent establishment of weeds along the edges of treated area it may be necessary to overlap the spray three to six inches onto sidewalks or driveways, etc., to ensure effective application rates in these especially vulnerable sites. Where temporary discoloration of pavement is undesirable, Do not rub or scrub surface, but rinse area immediately using a heavy spray of water to avoid staining. Allow treated turfgrass to dry before entering to avoid staining non-treated surfaces.

### **TURFGRASS TANK MIXES**

UP-End can be mixed with postemergence herbicides to control emerged weeds in non-residential turfgrasses. For annual grass control, applications can be made with DRIVE® or MSMA to control emerged weeds.

Broadleaf weeds can be controlled using Trimec, Three Way, 2-4,D and other similar products.

Before tank mixing, perform a simple jar test to insure compatibility of herbicides.

Refer to manufacturers' labels for specific use directions, precautions, and limitations before tank mixing with UP-End and follow those that are most restrictive.

### **TURFGRASS RESTRICTIONS**

- Use on well established turfgrass with a dense and uniform stand. If turf has been thinned or damaged due to winter injury, excessive moisture, etc., allow turf to recover before application.
- On newly planted areas, do not apply until the turfgrass has filled in and has been mowed at least four times. Applications made to overseeded warm-season turfgrasses may cause thinning or injury of the overseeded species.
- Do not use on bentgrass or *Poa annua* greens and tees or injury may occur.
- Delay reseeding or winter overseeding of treated turfgrass for at least three (3) months following the last UP-END herbicide application.
- Delay sprigging turfgrass for five (5) months after application.

### **LANDSCAPE AND GROUNDS MAINTENANCE**

UP-End can be incorporated into landscape and grounds maintenance programs to provide extended preemergence control of most annual grasses and certain broadleaf weeds in areas such as mulch beds, parking areas and roadsides, fencelines and borders, and around statuary or monuments. Ensure that these areas are free of emerged weeds before application. To remove emerged weeds either cultivate or tank mix UP-End with a postemergence product labeled for such use.

Not all ornamental species or cultivars of species have been tested for plant safety. Refer to the list of ornamental plant species found in this label. While UP-End may be used on plant species not listed on this label, a small number of plants should be tested at the specified rate to evaluate suitability before a broad-use application is made.

Refer to Table 2. Application Rates for Weed Control in Ornamental Plantings, Tree Plantations and Other Noncropland Areas. Avoid contact of spray solution with stone, wood, or other porous surfaces as staining may occur. Rinse surfaces immediately using a heavy spray of water to avoid staining.

### **ORNAMENTAL PLANTINGS AND TREE PLANTATIONS INCLUDING NONCROPLAND AREAS**

Use UP-End for grounds maintenance in noncropland areas, preemergence control of the weed species listed in and around established tree plantations for site preparation, and maintenance and conifer and hardwood seedling nurseries and pulpwood and fiber farms. UP-End may be used for hardwood and conifer regeneration on conservation reserve program (CRP) land. UP-End can also be used in Christmas trees and non-bearing fruit and nut crops and vineyards established, or bulb and wildflower field plantings, and in and around established ornamentals planted in noncropland areas such as highway rights-of-way and utility substations. Refer to Table 2. Application Rates for Weed Control in Ornamentals Plantings, Tree Plantations and Other Noncropland Areas.

**Applications at planting or to established trees:** When applying at planting, it is important that slit closure be achieved to prevent UP-End from directly contacting the tree roots or being washed into the root zone via the open slit or root stunting may occur. Refer to section on Instructions and Restrictions in Landscape and Ornamental Plantings before making an application.

For postemergence control of weeds, use tank-mix combinations of UP-End plus VANTAGE®, Roundup®, Finale®, or other labeled herbicides. Refer to approved labeling for species recommendations. Determine rates for the tank mix compounds from the product labels of both UP-End and partner herbicides before use. Take care to prevent

combination sprays from direct contact with desirable foliage or injury may result. UP-End plus diuron or simazine combinations will broaden weed control spectrum, however, use of combinations may restrict UP-End usage in sensitive areas. Refer to manufacturers' labels for specific use directions, precautions, and limitations before use and follow those that are most restrictive.

#### **ORNAMENTAL BULBS**

UP-End may be applied for control of susceptible annual weeds in ornamental bulbs listed under the Perennial Section on the label (crocus, daffodil [narcissus], gladiolus, lilies, tulip, etc.). Apply UP-End before, during or after bulb emergence. If weeds have already germinated add a labeled postemergence herbicide to control emerged weeds.

#### **WILDFLOWERS**

UP-End may be applied for control of susceptible annual weeds in plantings of wildflowers listed in the Perennial section on the label. Those perennial species noted (\*Black-eyed Susan, California Poppy, Coreopsis, Oxeye Daisy, etc.) have been evaluated for plant tolerance to applications of UP-End at 4.2 pints (2.1 quarts) per acre. UP-End may be applied to established perennial wildflowers before emergence of weeds or wildflowers. For wildflowers being established from seed, apply UP-End no sooner than 4 weeks after wildflowers have emerged but before weed germination. If weeds have already germinated, add a labeled postemergence product to control emerged weeds. Refer to all label restrictions before making an application.

Due to the diversity of species and varieties which exist in areas where wildflowers are grown, the response to UP-End may vary greatly. Test desirable species carefully to determine if area-wide applications can be made.

#### **NON-BEARING FRUIT AND NUTCROPS AND VINEYARDS**

UP-End may be applied for preemergence control of most annual grasses and certain broadleaf weeds on the following non-bearing crops:

Almond	Citrus	Olive	Pistachio
Apple	Fig	Peach	Plum
Apricot	Grape	Pear	Prune
Cherry	Nectarine	Pecan	Walnut, English

#### **NON-CROPLAND WEED CONTROL**

Use UP-End herbicide for preemergence control of most annual grasses and certain broadleaf weeds as they germinate on noncropland areas such as railroad, utility, highway, and pipeline rights-of-way, highway guardrails, delineators, and sign posts, utility substations, petroleum tank farms, pumping installations, fence rows, storage areas, windbreaks and shelterbelts.

#### **INDUSTRIAL (UNIMPROVED) TURF**

UP-End will provide preemergence control of the annual grasses and broadleaf weeds listed in Weed Species Controlled section of this label that might germinate in established grasses in rights-of-way, roadsides, construction sites, parks, substations or lots.

Apply before weeds germinate. A postemergence herbicide such as 2,4-D, DRIVE®, VANTAGE®, MSMA, or similar products may be tank mixed to control established weeds. Apply according to label instructions for the respective products and follow the most restrictive wording.

#### **TOTAL VEGETATION CONTROL**

UP-End may be tank mixed with ARSENAL®, SAHARA®, PLATEAU®, VANTAGE®, Roundup® PRO, Karmex®, Finale®, Oust®, diuron, glyphosate or other products to provide bare ground, or total vegetation control. UP-End can be used to provide greater plant selectivity in areas where such action may be desired. Such sites might have roots of landscape vegetation, ornamentals, or desirable trees encroaching into the treated zone. Refer to tank mix partner labels regarding effects on desirable plants. Do not tank mix with ARSENAL, SAHARA or PLATEAU herbicides in California.

Applications may be made to existing weeds controlled by the partner herbicide. Determine rates from the product labels before use. Follow the most restrictive label instructions.

For Kochia control, use a combination of UP-End with ARSENAL herbicide or diuron if control has been a problem for other herbicides.



**TABLE 2. APPLICATION RATES FOR WEED CONTROL IN LANDSCAPE ORNAMENTALS, TREE PLANTATIONS, AND OTHER NONCROP AREAS\***

For preemergence control of the weed species listed, apply UP-End as follows:

Length of Control	Product per Acre	Product per 1000 sq. ft.
Short Term Control (2-4 months)	2.1 Quarts	1.6 fl. oz.
Long Term Control (6-8 months)	4.2 Quarts	3.2 fl. oz.

\*For all turfgrass weed control rates, refer to Table 1 instructions.

For extended weed control, repeat applications of UP-End can be made.

## INSTRUCTIONS AND RESTRICTIONS

### LANDSCAPE AND ORNAMENTAL PLANTINGS<sup>1</sup>

Site	Application Instructions and Restrictions
Landscape Plantings <sup>2</sup>	<ol style="list-style-type: none"> <li>1. Do not apply to newly-transplanted ornamentals until plants have been watered and soil has been thoroughly packed and settled around roots.</li> <li>2. Apply as a directed or over-the-top spray.</li> <li>3. Use the lowest labeled rate when making applications to annuals. Repeat applications can be made for extended landscape weed control.</li> </ol>
Ornamental Bulbs <sup>3</sup>	<ol style="list-style-type: none"> <li>1. UP-End may be applied to bulb species listed on the label.</li> <li>2. Apply before, during or after bulb emergence, but not during bloom.</li> </ol>
Wildflowers <sup>3</sup>	<ol style="list-style-type: none"> <li>1. UP-End may be applied in plantings of wildflowers listed on the label. Refer to specific instructions for rate and plant tolerance.</li> <li>2. For wildflowers being established from seed, apply at 4 weeks after wildflowers have germinated, but before weed seed germination.</li> </ol>

<sup>1</sup> Plant only those desirable plant species listed on this label into soil treated the previous season with UP-End or injury may occur.

<sup>2</sup> Do not treat plants grown for food or feed. Do not use treated plants for food or feed.

<sup>3</sup> Before treating a large number of plants, spray a few plants and observe for 1-2 months for plant damage before full-scale application.

### HAND-HELD SPRAY EQUIPMENT:

Use table 2 above to determine the amount of UP-End to be applied per 1000 square feet, in sufficient water for thorough coverage without runoff. Calibration of backpack or other hand-held equipment will vary with each operator. Determine the amount of water needed to treat 1000 square feet before mixing the spray solution. Follow information in **MIXING INSTRUCTIONS** section of this label.

UP-End will not control established weeds. If weeds germinate before activation of herbicide, shallow cultivate to destroy existing weeds or, where practical, remove by hand. Any necessary cultivation must be shallow. UP-End may be used together with herbicides registered for postemergence use (i.e. glyphosate or Finale) for the control of established weeds. Do not apply sprays containing glyphosate or Finale over the top of desirable plants. A UP-End treatment may be followed by any registered herbicide to control weeds not listed on the UP-End label.

The efficacy of UP-End will be best if the application is followed by one-half inch of rainfall or its equivalent in sprinkler irrigation. Erratic weed control may result if UP-End is not activated by rainfall or irrigation within 30 days.

The following grass and broadleaf weeds are controlled by preemergence treatments of UP-End herbicide at the above-specified rates:

### GRASSES CONTROLLED

Common Name	Scientific Name
Barnyardgrass	<i>Echinochloa crus-galli</i>
Bluegrass, Annual	<i>Poa annua</i>

Crabgrass	<i>Digitaria</i> spp.
Crowfootgrass	<i>Dactyloctenium aegyptium</i>
Foxtail, Giant	<i>Setaria faberi</i>
Foxtail, Green	<i>Setaria viridis</i>
Foxtail, Yellow	<i>Setaria glauca</i>

Goosegrass	<i>Eleusine indica</i>	Clover, Hop	<i>Trifolium procumbens</i>
Itcbgrass	<i>Rottboellia exaltata</i>	Cudweed	<i>Gnaphalium</i> spp.
Johnsongrass (from seed)	<i>Sorghum halepense</i>	Evening primrose	<i>Oenothera biennis</i>
Junglerice	<i>Echinochloa colona</i>	Fiddleneck	<i>Amsinckia intermedia</i>
Lovegrass (from seed)	<i>Eragrostis</i> spp.	Filaree	<i>Erodium</i> spp.
Panicum, Browntop	<i>Panicum fasciculatum</i>	Henbit	<i>Lamium amplexicaule</i>
Panicum, Fall	<i>Panicum</i>	Knotweed, prostrate	<i>Polygonum aviculare</i>
	<i>dichotomiflorum</i>	Kochia	<i>Kochia scoparia</i>
Panicum, Texas	<i>Panicum texanum</i>	Lambsquarters	<i>Chenopodium album</i>
Sandbur, Field	<i>Cenchrus incertus</i>	Pigweed	<i>Amaranthus</i> spp.
Signalgrass	<i>Brachiaria</i>	Puncturevine	<i>Tribulus terrestris</i>
	<i>platyphylla</i>	Purslane	<i>Portulaca oleracea</i>
Sprangletop, Mexican	<i>Leptochloa uninervia</i>	Pusley, Florida	<i>Richardia scabra</i>
Sprangletop, Red	<i>Leptochloa filiformis</i>	Rocket, London	<i>Sisymbrium irio</i>
Witchgrass	<i>Panicum capillare</i>	Shepherdspurse	<i>Capsella bursa-pastoris</i>
Woolly Cupgrass	<i>Eriochloa villosa</i>		
<b>BROADLEAF WEEDS CONTROLLED</b>		Smartweed, Pennsylvania	<i>Polygonum pensylvanicum</i>
<b>Common Name</b>	<b>Scientific Name</b>	Speedwell, Corn	<i>Veronica arvensis</i>
Burweed, Lawn	<i>Soliva pterosperma</i>	Spurge, Annual	<i>Euphorbia</i> spp.
Carpetweed	<i>Mollugo verticillata</i>	Spurge, Prostrate	<i>Euphorbia humistrata</i>
Chickweed, Common	<i>Stellaria media</i>	Woodsorrel, Yellow	<i>Oxalis stricta</i>
Chickweed, Mouseear	<i>Cerastium vulgatum</i>	Velvetleaf (Buttonweed)	<i>Abutilon theophrasti</i>

## COMMERCIAL ORNAMENTAL PRODUCTION

### GENERAL INFORMATION

**Application Use Sites:** UP-End can be used in and around field, liner and container ornamental production.

UP-End sprays may be used around and over the top of the established plants listed in Table 4 of this label. However, not all varieties or strains of the plant species listed have been tested. Refer to ornamental instructions and restrictions in this label before any application of UP-End. Unintentional consequences such as crop injury may result because of certain environmental or growing conditions, manner of use or application. Therefore, before treating a large number of plants, spray a few plants and observe for plant damage before full-scale application.

### APPLICATION INSTRUCTIONS

UP-End will not control established weeds. Therefore, ensure that areas to be treated are free of established weeds at the time of treatment, or UP-End may be used together with herbicides registered for postemergence use in ornamentals and vegetation control sites. Consult the labels of those herbicides for suggested treatments, rates to be used and precautions or restrictions for use in these areas.

The efficacy of UP-End will be best if the application is followed by one-half inch of rainfall or its equivalent in sprinkler irrigation. If UP-End is not activated by rainfall or irrigation within 30 days, erratic weed control may result.

Applied according to label directions and under normal growing conditions, UP-End or UP-End tank-mix combinations will not cause crop injury. Over-application can result in crop stand loss, crop injury, or soil residues. Uneven application can decrease weed control or cause crop injury.

Seedling diseases, cold weather, excessive moisture, high soil pH, high soil salt concentration, or drought can weaken seedlings and plants, and increase the possibility of plant damage from UP-End.

### SPRAYING INSTRUCTIONS

Apply uniformly with properly calibrated ground equipment in suggested spray volumes of 20-200 gpa for ornamental applications to uniformly treat the area with a spray pressure of 25 to 50 psi. Maintain continuous agitation during spraying with good mechanical or bypass agitation. Avoid overlaps that will increase rates above those specified. Avoid application when winds may cause drift.

Avoid contact of spray solution with driveways, stone, wood, or other porous surfaces. Rinse immediately with water to avoid staining. Avoid mechanically scrubbing until surface area is thoroughly rinsed using a heavy spray of water.

### INSTRUCTIONS AND RESTRICTIONS<sup>1</sup> IN PRODUCTION ORNAMENTALS

Do not apply in greenhouses, shadehouses or other enclosed structures.

Site	Application Instructions and Restrictions
Newly-Transplanted Field-Grown Nursery Stock <sup>2,3</sup>	<ol style="list-style-type: none"> <li>1. Do not make over-the-top applications at time of field transplanting. Use shielded sprayer until plantings have been established for one (1) year or more in the field.</li> <li>2. Do not apply until transplants have been watered and soil has been thoroughly packed and settled around transplants. Take care to ensure there are no cracks in the soil where UP-End herbicide could come into contact with the roots.</li> <li>3. <b>DO NOT</b> apply during bud swell, bud break or at time of first flush of new growth.</li> <li>4. Direct sprays away from graphed or budded tissue on transplants at all times.</li> </ol>
Newly-Transplanted Container-Grown Nursery Stock <sup>2,3</sup>	<ol style="list-style-type: none"> <li>1. Do not apply until transplants have been watered and soil has been thoroughly packed and settled around transplants. Care must be taken to ensure there are no cracks in the soil where UP-End could come into contact with the roots.</li> <li>2. For container grown ornamentals, delay first application of the product to bareroot liners for two (2) weeks after transplanting.</li> <li>3. Do not apply during bud swell, bud break or at time of first flush of new growth.</li> <li>4. Direct sprays away from graphed or budded tissue on transplants at all times.</li> </ol>
Established Container, or Field-Grown Nursery Stock <sup>2,3</sup>	<ol style="list-style-type: none"> <li>1. Do not apply during bud swell, bud break or at time of first flush of new growth.</li> <li>2. Apply as a directed or over-the-top spray.</li> <li>3. If newly budded or graphed rootstock, make an application using a shielded sprayer.</li> <li>4. Take care to ensure there are no cracks in the soil where UP-End could come into contact with the roots.</li> </ol>
Bare Ground for Container Placement	<ol style="list-style-type: none"> <li>1. Apply to soil then water in (including mulch, gravel, wood chips, or other permeable base), replace containerized ornamentals onto pad.</li> </ol>

<sup>1</sup> Plant only those desirable plant species listed on this label into soil treated the previous season with UP-End or injury may occur.

<sup>2</sup> Before treating a large number of plants, spray a few plants and observe for 1-2 months for plant damage before full-scale application.

<sup>3</sup> Do not treat plants grown for food or feed. Do not use treated plants for food or feed.

Refer to Table 3. Application Rates for Weed Control in Production Ornamentals.

### ORNAMENTAL TANK MIXES

Emergent weeds in ornamentals can be controlled using tank mixes containing VANTAGE®, Roundup®, Finale®, Ornamec®, Gallery®, Princep®, and other similar products. Do not apply sprays containing Roundup or Finale over the top of ornamental plants.

Before tank mixing, perform a simple jar test to insure compatibility of herbicides.

Refer to manufacturers' labels for specific use directions, precautions, and limitations before tank mixing with UP-End herbicide and follow those that are most restrictive.

### CHRISTMAS TREE PLANTATIONS

UP-End may be used in and around Christmas tree plantations. UP-End may be applied at planting or to established trees. When making an application at planting, it is important that slit closure be achieved to prevent UP-End from directly contacting the tree roots or being washed into the root zone via the open slit or root stunting may occur.

For postemergence control of weeds, use tank-mix combinations of UP-End plus VANTAGE, Roundup, Finale, or other labeled herbicides. Refer to approved labeling for species information. Determine rates for the tank-mix compounds from the product labels of both UP-End and partner herbicides before use. Precaution must be exercised to prevent combination sprays from direct contact with desirable foliage or injury may result. UP-End plus diuron or simazine combinations will broaden weed control spectrum; however, use of combinations may restrict UP-End usage in sensitive areas. Refer to manufacturers' labels for specific use directions, precautions, and

limitations before use and follow those that Refer to Table 3. Application Rates for Weed Control in Production Ornamentals.

#### VEGETATION CONTROL IN ORNAMENTAL PRODUCTION

UP-End may be used for preemergence control of most annual grasses and certain broadleaf weeds as they germinate on noncropland areas such as sign posts, pumping installations, fence rows, storage areas, and windbreaks and shelterbelts. UP-End may be tank mixed with VANTAGE, Roundup PRO, Karmex<sup>®</sup>3, Finale<sup>®</sup>4, diuron, glyphosate or other products to provide bare ground or total vegetation control, or can be used to provide greater plant selectivity in areas where such action may be desired. Such sites might have roots of landscape vegetation, ornamentals, or desirable trees encroaching into the treated zone. Refer to tank mix partner labels regarding effects on desirable plants. Applications may be made to existing weeds controlled by the partner herbicide. Determine rates from the product labels before use. Follow the most restrictive label instructions. Refer to Table 3. Application Rates For Weed Control In Production Ornamentals.

**Table 3. APPLICATION RATES FOR WEED CONTROL IN PRODUCTION ORNAMENTALS\***

For preemergence control of the weed species listed, apply UP-End at the following rates:

Length of Control	Product per Acre	Product per 1000 sq. ft.
Short Term Control (2-4 months)	2.1 Quarts	1.6 fl. oz.
Long Term Control (6-8 months)	4.2 Quarts	3.2 fl. oz.

\*For extended weed control, repeat applications of UP-End can be made.

#### HAND-HELD SPRAY EQUIPMENT:

Use the table above to determine the amount of UP-End to be applied per 1000 square feet. The amount of water used for the application is not critical but should be sufficient for thorough coverage without runoff. Calibration of backpack or other hand-held equipment will vary with each operator. Determine the amount of water needed to treat 1000 square feet before mixing the spray solution. Follow information in MIXING INSTRUCTIONS section of this label.

UP-End will not control established weeds. If weeds germinate before activation of herbicide, shallow cultivate to destroy existing weeds or, where practical, remove by hand. Any cultivation must be shallow. UP-End may be used together with herbicides registered for postemergence use (i.e. Roundup or Finale) for the control of established weeds. Do not apply sprays containing Roundup or Finale over the top of desirable plants. A UP-End treatment may be followed by any registered herbicide to control weeds not listed on the UP-End label.

The efficacy of UP-End will be improved if the application is followed by one-half inch of rainfall or its equivalent in sprinkler irrigation. Erratic weed control may result if UP-End is not activated by rainfall or irrigation within 30 days.

The following grass and broadleaf weeds are controlled by preemergence treatments of UP-End at the above-specified rates:

#### GRASSES CONTROLLED

Common Name	Scientific Name
Barnyardgrass	<i>Echinochloa crus-galli</i>
Bluegrass, Annual	<i>Poa annua</i>
Crabgrass	<i>Digitaria</i> spp.
Crowfootgrass	<i>Dactyloctenium aegyptium</i>
Foxtail, Giant	<i>Setaria faberi</i>
Foxtail, Green	<i>Setaria viridis</i>
Foxtail, Yellow	<i>Setaria glauca</i>
Goosegrass	<i>Eleusine indica</i>
Itchgrass	<i>Rottboellia exaltata</i>

Johnsongrass (from seed)	<i>Sorghum halepense</i>
Junglerice	<i>Echinochloa colona</i>
Lovegrass (from seed)	<i>Eragrostis</i> spp.
Panicum, Browntop	<i>Panicum fasciculatum</i>
Panicum, Fall	<i>Panicum dichotomiflorum</i>
Panicum, Texas	<i>Panicum texanum</i>
Sandbur, Field	<i>Cenchrus incertus</i>
Signalgrass	<i>Brachiaria platyphylla</i>
Sprangletop, Mexican	<i>Leptochloa uninervia</i>
Sprangletop, Red	<i>Leptochloa filiformis</i>
Witchgrass	<i>Panicum capillare</i>
Woolly Cupgrass	<i>Eriochloa villosa</i>

**BROADLEAF WEEDS CONTROLLED**

Common Name	Scientific Name
Burweed, Lawn	<i>Soliva pterosperma</i>
Carpetweed	<i>Mollugo verticillata</i>
Chickweed, Common	<i>Stellaria medio</i>
Chickweed, Mouseear	<i>Cerastium vulgatum</i>
Clover, Hop	<i>Trifolium procumbens</i>
Cudweed	<i>Gnaphalium</i> spp.
Eveningprimrose	<i>Oenothera biennis</i>
Fiddleneck	<i>Amsinckia intermedia</i>
Filaree	<i>Erodium</i> spp.
Henbit	<i>Lamium amplexicaule</i>
Knotweed, prostrate	<i>Polygonum aviculare</i>
Kochia	<i>Kochia scoparia</i>
Lambsquarters	<i>Chenopodium album</i>
Pigweed	<i>Amaranthus</i> spp.
Puncturevine	<i>Tribulus terrestris</i>
Purslane	<i>Portulaca oleracea</i>
Pusley, Florida	<i>Richardia scabra</i>
Rocket, London	<i>Sisymbrium irtio</i>
Shepherdspurse	<i>Capsella bursa-pastoris</i>
Smartweed, Pennsylvania	<i>Polygonum pennsylvanicum</i>
Speedwell, Corn	<i>Veronica arvensis</i>
Spurge, Annual	<i>Euphorbia</i> spp.
Spurge, Prostrate	<i>Euphorbia humistrata</i>
Woodsorrel, Yellow	<i>Oxalis stricta</i>
Velvetleaf (Buttonweed)	<i>Abutilon theophrasti</i>

**Table 4. ORNAMENTAL SPECIES**

UP-End herbicide sprays may be used around and over the top of the established plants listed below. Refer to Ornamental Instructions and Restrictions before application. Refer to Table 3. Application Rates For Weed Control Production Ornamentals.

**TREES**

Common Name	Scientific Name
Alder, European Black	<i>Alnus glutinosa</i>
Apple	<i>Malus</i> spp.
Arborvitae, American	<i>Thuja occidentalis</i>
Arbutus	<i>Arbutus</i> spp.
Ash, Red	<i>Fraxinus pennsylvanica</i>
Ash, White	<i>Fraxinus americana</i>
Aspen, Bigtooth	<i>Populus grandidentata</i>
Aspen, Quaking	<i>Populus tremuloides</i>
Basswood	<i>Tilia</i> spp.
Birch, European Weeping	<i>Betula pendula</i>
Birch, River	<i>Betula nigra</i>

**TREES (continued)**

Common Name	Scientific Name
Buckeye, Red	<i>Aesculus pavia</i>
Cedar, White	<i>Thuja occidentalis</i>
Chamaecyparis, Boulevard	<i>Chamaecyparis pisifera</i>
Cherry, Black	<i>Prunus serotina</i>
Cherry, Choke	<i>Prunus virginiana</i>
Cherry, Kwanzan	<i>Prunus serrulata</i>
Cherry, Nanking	<i>Prunus tomentosa</i>
Cottonwood	<i>Populus deltoides</i>
Crabapple	<i>Malus</i> spp.
Crepe Myrtle	<i>Lagerstroemia indica</i>
Cryptomeria, Japanese Cedar	<i>Cryptomeria japonica</i>
Cypress, Bald	<i>Taxodium distichum</i>
Cypress, Leyland	<i>Cupressocyparis leylandii</i>
Dogwood, Flowering	<i>Cornus florida</i>
Dogwood, Korean	<i>Cornus kousa</i>
Dogwood, Silky	<i>Cornus amomum</i>
Dogwood, Shrub	<i>Cornus</i> spp.
Elm	<i>Ulmus japonica</i>
Elm, Winged	<i>Ulmus alato</i>
Eucalyptus (Silver-dollar) tree	<i>Eucalyptus cinerea</i>
Fir, Balsam	<i>Abies balsamiae</i>
Fir, Douglas	<i>Pseudotsuga menziesii</i>
Fir, Fraser	<i>Abies fraseri</i>
Fir, White	<i>Abies concolor</i>
Franklinia	<i>Franklinia</i> spp.
Fringe tree	<i>Chlonenthus retusus</i>
Ginkgo	<i>Ginkgo biloba</i>
Gum, Black	<i>Nyssa sylvatica</i>
Gum, Sour	<i>Nyssa sylvatica</i>
Haw, Black	<i>Viburnum prunifolium</i>
Hawthorn	<i>Crataegus</i> spp.
Hemlock, Canada	<i>Tsuga canadensis</i>
Hemlock, Eastern	<i>Tsuga canadensis</i>
Holly, American	<i>Ilex opaca</i>
Honeylocust	<i>Gleditsia triacanthos</i>
Lilac, Common	<i>Syringa vulgaris</i>
Lilac, Japanese Tree	<i>Syringa reticulata</i>
Linden	<i>Tilia</i> spp.
Magnolia, Saucer	<i>Magnolia soulangiana</i>
Magnolia, Southern	<i>Magnolia grandiflora</i>
Magnolia, Star	<i>Magnolia stellata</i>
Maidenhair Tree	<i>Ginkgo biloba</i>
Maple, Norway	<i>Acer platanoides</i>
Maple, Japanese	<i>Acer palmatum</i>
Maple, Red	<i>Acer rubrum</i>

Maple, Sugar	<i>Acer saccharum</i>
<b>TREES (continued)</b>	
Common Name	Scientific Name
Nannyberry, Rusty	<i>Viburnum rufidulum</i>
Oak, Chinquapin	<i>Quercus muehlenbergii</i>
Oak, Live	<i>Quercus virginiana</i>
Oak, Pin	<i>Quercus palustris</i>
Oak, Red	<i>Quercus rubra</i>
Oak, Swamp Chestnut	<i>Quercus michauxii</i>
Oak, Water	<i>Quercus nigra</i>
Oak, White	<i>Quercus alba</i>
Oak, Willow	<i>Quercus phellos</i>
Olive	<i>Olea europaea</i>
Palm, Date	<i>Phoenix</i> spp.
Palm, Fan	<i>Washingtonia</i> spp.
Palm, Pindo	<i>Butia</i> spp.
Palm, Washington	<i>Washingtonia</i> spp.
Peach	<i>Prunus persica</i>
Pear, Bradford	<i>Pyrus calleryana</i> 'Bradford'
Pecan	<i>Carya illinoensis</i>
Pine, Austrian	<i>Pinus nigra</i>
Pine, Italian Stone	<i>Pinus pinea</i>
Pine, Loblolly	<i>Pinus taeda</i>
Pine, Monterey	<i>Pinus radiata</i>
Pine, Red	<i>Pinus resinosa</i>
Pine, Scotch	<i>Pinus sylvestris</i>
Pine, Virginia	<i>Pinus virginiana</i>
Pine, White	<i>Pinus strobus</i>
Plum, Purple Leaf	<i>Prunus cerasifera</i>
Poplar, Black	<i>Populus nigra</i>
Redcedar, Eastern	<i>Juniperus virginiana</i>
Redcedar, Western	<i>Thuja plicata</i>
Red Ironbark	<i>Eucalyptus sideroxylon</i> 'Rosea'
Redwood, Dawn	<i>Metasequoia glyptostroboides</i>
Sequoia, Giant	<i>Sequoiadendron giganteum</i>
Serviceberry	<i>Amelanchier laevis</i>
Sourwood	<i>Oxydendrum arboreum</i>
Spruce, Colorado Blue	<i>Picea pungens</i>
Spruce, Dwarf Alberta	<i>Picea glauca</i> 'albertiana'
Spruce, Norway	<i>Picea abies</i>
Spruce, White	<i>Picea glauca</i>
Sweetgum	<i>Liquidambar styraciflua</i>
Sycamore	<i>Platanus occidentalis</i>
Trachycarpus	<i>Trachycarpus</i> spp.

Tulip tree	<i>Liriodendron tulipifera</i>
<b>TREES (continued)</b>	
Common Name	Scientific Name
Walnut, Black	<i>Juglans nigra</i>
Willow, Weeping	<i>Salix babylonica</i>
Yellowwood	<i>Cladrastis lutea</i>
<b>SHRUBS</b>	
Common Name	Scientific Name
Abelia, Glossy	<i>Abelia grandiflora</i>
Alder, Witch	<i>Fothergilla gardenii</i>
Aucuba, Gold	<i>Aucuba japonica</i>
Azalea	<i>Rhododendron</i> sp.
Bamboo, Heavenly	<i>Nandina domestica</i>
Barberry	<i>Berberis</i> <i>gladwynensis</i>
Barberry, Japanese	<i>Berberis thunbergii</i>
Blue Indigo Bush	<i>Dalea gregii</i>
Bottlebrush, Lemon	<i>Callistemon citrinus</i>
Boxwood, Common	<i>Buxus sempervirens</i>
Boxwood, Japanese	<i>Buxus microphylla</i>
Brittlebush	<i>Encelia farinosa</i>
Buttonbush	<i>Cephalanthus occidentalis</i>
Camellia	<i>Camellia japonica</i>
Cape Jasmine	<i>Gardenia jasminoides</i>
Cassia, Feathery	<i>Cassia artemisioides</i>
Cordyline	<i>Cordyline</i> spp.
Correa	<i>Correa</i> spp.
Cotoneaster	<i>Cotoneaster apiculatus</i>
Cotoneaster, Bayberry	<i>Cotoneaster dammeri</i>
Cotoneaster, Rock	<i>Cotoneaster horizontalis</i>
Cypress, Italian	<i>Cupressus sempervirens</i>
Cypress, Leyland	<i>Cupressocyparis leylandii</i>
Deutzia, Slender	<i>Deutzia gracilis</i>
Dogwood, Red Twig	<i>Cornus sericea</i>
Elaeagnus	<i>Elaeagnus ebbingei</i>
Escallonia	<i>Escallonia fradesii</i>
Euonymus	<i>Euonymus fortunei</i>
Euonymus, Golden	<i>Euonymus japonica</i>
Euonymus, Winged	<i>Euonymus alata</i>
Firethorn	<i>Pyracantha coccinea</i>
Forsythia, Border	<i>Forsythia intermedia</i>
Fragrant Olive	<i>Osmanthus fragrans</i>
Fuschia, California	<i>Zauschneria californica</i>
Gardenia	<i>Gardenia jasminoides</i>

Hawthorne, Indian	<i>Raphiolepis indica</i>
Hibiscus	<i>Hibiscus syriacus</i>
Holly, Chinese	<i>Ilex cornuta</i>

**SHRUBS (continued)**

Common Name	Scientific Name
Holly, Japanese	<i>Ilex crenata</i>
Holly, Fosters	<i>Ilex attenuata</i> 'Fosteri'
Holly, Savannah	<i>Ilex attenuata</i>
Holly, Yaupon	<i>Ilex vomitoria</i>
Honeysuckle, Bush	<i>Diervilla lonicera</i>
Hopseed Bush	<i>Dodonaea viscosa</i>
Hopbush	<i>Dodonaea viscosa</i>
Hydrangea	<i>Hydrangea macrophylla</i>
Juniper	<i>Juniperus</i> sp.
Juniper, Chinese	<i>Juniperus chinensis</i> v. pfitzer
Juniper, Shore	<i>Juniperus conferta</i>
Juniper, Trailing	<i>Juniperus horizontalis</i>
Laurel, Cherry	<i>Prunus laurocerasus</i>
Laurel, Mountain	<i>Kalmia latifolia</i>
Laurel, Otto Luyken	<i>Prunus laurocerasus</i>
Laurel, Schipka	<i>Prunus schipkanensis</i>
Laurustinus	<i>Viburnum tinus</i>
Lavender, English	<i>Lavandula angustifolia</i>
Leucothoe	<i>Leucothoe fontanesiana</i>
Leucothoe, Coast	<i>Leucothoe axillaris</i>
Lilac, Cut-leaf	<i>Syringa laciniata</i>
Lily-of-the-Nile	<i>Agapanthus africanus</i>
Mahonia	<i>Mahonia aquifolium</i>
Mock Orange	<i>Pittosporum tobira</i>
Myrtle, Compact	<i>Myrtus communis</i>
Myrtle, Wax	<i>Myrica cerifera</i>
Nandina	<i>Nandina domestica</i>
Oleander	<i>Nerium oleander</i>
Oregon Grape	<i>Mahonia aquifolium</i>
Osmanthus	<i>Osmanthus fragrans</i>
Palm, European Fan	<i>Chamaerops humilis</i>
Palm, Mediterranean Fan	<i>Chamaerops</i> spp.
Phlox, Prickly	<i>Leptodactylon californicum</i>
Photinia, Fraser	<i>Photinia x Fraseri</i>
Pieris, Japanese	<i>Pieris japonica</i>
Pine, Mugo	<i>Pinus mugo</i>
Plum, Natal	<i>Carissa grandiflora</i>
Privet, California	<i>Ligustrum ovalifolium</i>
Privet, Glossy	<i>Ligustrum lucidum</i>
Privet, Variegated	<i>Ligustrum sinensis</i>
Privet, Waxleaf	<i>Ligustrum japonicum</i>

Pyracantha	<i>Pyracantha coccinea</i>
Quince, Flowering	<i>Chaenomeles japonica</i>
Ranger, Texas	<i>Leucophyllum frutescens</i>

**SHRUBS (continued)**

Common Name	Scientific Name
Redroot	<i>Ceanothus</i> spp.
Rhododendron	<i>Rhododendron</i> spp.
Robira	<i>Pittosporum tobira</i>
Rose	<i>Rosa</i> spp.
Spice Plant	<i>Illicium parviflorum</i>
Spiraea	<i>Spiraea vanhouttei</i>
Spiraea, Anthony Waterer	<i>Spiraea X bumalda</i>
Spiraea, Japanese	<i>Spiraea japonica</i>
Sweet Bay	<i>Laurus nobilis</i>
Trumpet Bush	<i>Tecoma stans</i>
Verbena, Lemon	<i>Aloysia triphylla</i>
Viburnum	<i>Viburnum suspensum</i>
Vitex	<i>Vitex</i> spp.
Weigela	<i>Weigela florida</i>
Wild Lilac	<i>Ceanothus</i> spp.
Wisteria	<i>Wisteria</i> spp.
Xylosma	<i>Xylosma congestum</i>
Yellowbells	<i>Tecoma stans</i>
Yew*	<i>Taxus media</i>
Yew, Japanese*	<i>Taxus cuspidata</i>
Yew, Southern*	<i>Podocarpus macrophyllus</i>
Yucca, Adam's Needle	<i>Yucca filamentosa</i>
Yucca, Weeping	<i>Yucca pendula</i>

\* Do not apply UP-End herbicide during spring growth or injury to terminals may occur.

**GROUND COVERS**

Common Name	Scientific Name
Ajuga	<i>Ajuga reptans</i>
Baby Sun Rose	<i>Aptenia cordifolia</i>
Beach Strawberry	<i>Fragaria chiloensis</i>
Capeweed	<i>Arctotheca calendula</i>
Cinquefoil, Spring	<i>Potentilla verna</i>
Coyotebrush, Dwarf	<i>Baccharis pitularis</i>
Daisy, Trailing African	<i>Osteospermum fruticosum</i>
Dymondia	<i>Dymondia margaretae</i>
Gazania	<i>Gazania splendens</i>
Iceplant, Large Leaf	<i>Carpobrotus edulis</i>
Ivy, English	<i>Hedera helix</i>
Ivy, Geranium	<i>Pelargonium peltatum</i>
Jasmine, Asiatic	<i>Trachelospermum asiaticum</i>



Jasmine, Primrose	<i>Jasminum mesnyi</i>
Jessamine, Carolina	<i>Gelsemium</i> <i>sempervirens</i>
Manzanita, Bearberry	<i>Arctostaphylos</i> <i>uva-ursi</i>

**GROUND COVERS (continued)**

Common Name	Scientific Name
Miscanthus	<i>Miscanthus</i> spp.
Mondograss	<i>Ophiopogon japonica</i>
Morning glory	<i>Convolvulus</i> spp.
Myoporum	<i>Myoporum</i> <i>parvifolium</i>
Pachysandra	<i>Pachysandra</i> <i>terminalis</i>
Potentilla	<i>Potentilla fruticosa</i>
Red Apple	<i>Aptenia cordifolia</i>
Rosemary	<i>Rosemarinus</i> <i>officinalis</i>
Rose-Of-Sharon	<i>Hypericum calycinum</i>
Sand Strawberry	<i>Fragaria chiloensis</i>
Sedum	<i>Sedum spurium</i>
St. Johnswort, Creeping	<i>Hypericum calycinum</i>
Stonecrop	<i>Sedum spurium</i>
Verbena, Peruvian	<i>Verbena peruviana</i>
Vervain	<i>Verbena peruviana</i>
Vetch, Crown	<i>Vicia sativa</i>
Vinca	<i>Vinca minor</i>
Wintercreeper	<i>Euonymus fortunei</i>

**PERENNIALS**

Common Name	Scientific Name
Acacia	<i>Acacia redalens</i>
Asparagus	<i>Asparagus</i> spp.
Aster, New York	<i>Aster novi-belgii</i>
Aster, Stokes	<i>Stokesia laevis</i>
Astilbe (False Spirea)	<i>Astilbe</i> spp.
Avens	<i>Geum triflorum</i>
Baby's Breath	<i>Gypsophila elegans</i>
Baby's Breath	<i>Gypsophila</i> <i>paniculata</i>
Beard-Tongue	<i>Penstemon</i> spp.
Bellflower	<i>Campanula</i> spp.
Bellflower, Willow	<i>Campanula</i> <i>persicifolia</i>
Bird of Paradise	<i>Caesalpinia</i> <i>pulcherrima</i>
Black-eyed Susan†	<i>Rudbeckia hirta</i>
Blanket Flower†	<i>Gaillardia aristata</i>
Blanket Flower†	<i>Gaillardia</i> x <i>grandiflora</i>
Bleeding Heart	<i>Dicentra spectabilis</i>
Butterfly Weed	<i>Asclepias tuberosa</i>

California Poppy	<i>Eschscholzia</i> <i>californica</i>
Calla Lily	<i>Zantedeschia</i> <i>aethiopica</i>
Canna, Common Garden	<i>Canna generalis</i> 'Lucifer'

**PERENNIALS (continued)**

Common Name	Scientific Name
Carex	<i>Carex</i> spp.
Chincherinchee	<i>Ornithogalum</i> <i>thyrsoides</i>
Clover, Crimson†	<i>Trifolium incarnatum</i>
Columbine	<i>Aquilegia</i> 'McKana Giant'
Columbine	<i>Aquilegia</i> x <i>hybrida</i>
Coreopsis (tickseed)†	<i>Coreopsis lanceolata</i>
Crinum Lily	<i>Crinum</i> spp.
Crocus	<i>Crocus</i> spp.
Daffodil	<i>Narcissus</i> spp.
Daylily	<i>Hemerocallis</i> spp.
Fairy Duster	<i>Calliandra eriophylla</i>
Fern, Asparagus	<i>Asparagus officinalis</i>
Fern, Boston	<i>Nephrolepis exaltata</i>
Fern, Hay-scented	<i>Dennstaedtia</i> <i>punctilobula</i>
Fern, Leatherleaf*	<i>Rumahra</i> <i>adiantiformis</i>
Fortnight Lily	<i>Moraea</i> spp.
Foxglove	<i>Digitalis purpurea</i>
Freesia	<i>Freesia</i> x <i>hybrida</i>
Gaillardia	<i>Gaillardia pulchella</i>
Geum	<i>Geum</i> spp.
Gladiolus	<i>Gladiolus</i> spp.
Heather, Dwarf	<i>Calluna vulgaris</i>
Hosta	<i>Hosta</i> spp.
Indian Blanket†	<i>Gaillardia pulchella</i>
Iris, Japanese	<i>Iris kaempferi</i>
Lantana, Weeping	<i>Lantana</i> <i>montevidensis</i>
Leopards Bane	<i>Doronicum cordatum</i>
Lily	<i>Lilium</i> spp.
Liriope, Big Blue	<i>Liriope muscari</i>
Liriope, Creeping	<i>Liriope spicata</i>
Liriope, Variegated	<i>Liriope muscari</i>
Moonbeam	<i>Coreopsis verticillata</i>
Montbretia	<i>Crocasmia</i> <i>crocasmiflora</i>
Mugwort, Western	<i>Artemisia</i> <i>ludoviciana</i>
Nightshade	<i>Solanum</i> spp.
Orchid, Peacock	<i>Acidanthera bicolor</i>

Oxeye Daisy†	<i>Chrysanthemum leucanthemum</i>
Palm, Areca	<i>Chrysalidocarpus lutescens</i>
Palm, Pygmy Date	<i>Phoenix roebelenae</i>
Palm, Washington	<i>Washingtonia robusta</i>
Peony, Chinese	<i>Paeonia lactiflora</i>
Purple Coneflower†	<i>Echinacea purpurea</i>

**PERENNIALS (continued)**

Common Name	Scientific Name
Purple Gay-feather	<i>Liatris pycnostachya</i>
Purple Loosestrife	<i>Lythrum virgatum</i>
Rodgersia	<i>Rodgersia henricie</i>
Rosemary	<i>Rosmarinus officinalis</i>
Sedge	<i>Carex</i> spp.
Shasta Daisy†	<i>Chrysanthemum x superbum</i>
Statice	<i>Limonium latifolia</i>
Statice, German	<i>Goniolimon tartaricum</i>
Sweet Flag	<i>Acorus calamus</i>
Tickseed†	<i>Coreopsis lanceolata</i>
Texas Bluebonnet	<i>Lupinus texensis</i>
Tulip	<i>Tulipa</i> spp.
Wonder Flower	<i>Ornithogalum thyrsoides</i>
Yarrow†	<i>Achillea millefolium</i>
Zephyr Lily	<i>Zephyranthes</i> spp.

\* Applications of UP-End herbicide to immature ferns (during periods of new growth of fronds) may result in some injury.

† These plants have shown tolerance to UP-End applications of 4.2 pints (2.1 quarts) in wildflower plantings established from seed.

**ORNAMENTAL GRASSES**

Common Name	Scientific Name
Beach Grass	<i>Ammophila breviligulata</i>
Fescue, Blue	<i>Festuca glauca</i>
Fescue, Sheep	<i>Festuca ovina</i>
Fountain Grass	<i>Pennisetum setaceum</i>
Pampas Grass	<i>Cortaderia selloana</i>
Reed Canary Grass	<i>Phalaris arundinacea</i>
Reed, Giant	<i>Arundo</i> spp.
Ribbon Grass	<i>Phalaris arundinacea</i>
Tufted Hair Grass	<i>Deschampsia caespitosa</i>

**BEDDING PLANTS**

Common Name	Scientific Name
Ageratum	<i>Ageratum houstonianum</i>
Alyssum*	<i>Alyssum saxatile</i>
Anemone, Poppy-flowered	<i>Anemone coronaria</i>
Artemesia	<i>Artemesia</i> spp.
Balloonflower	<i>Platycodon grandiflorum</i>
Begonia*	<i>Begonia</i> spp.
Cabbage, Ornamental	<i>Brassica oleracea</i>

**BEDDING PLANTS (continued)**

Common Name	Scientific Name
Caladium	<i>Caladium</i> spp.
Cast-Iron Plant	<i>Aspidistra elatior</i>
China Aster*	<i>Callistephus chinensis</i>
Crocasmia, Montebretia	<i>Crocasmia x crocosmiiflora</i>
Dahlia*	<i>Dahlia</i> spp.
Dianthus	<i>Dianthus barbatus</i>
Dusty Miller	<i>Senecio cineraria</i>
Gayfeather	<i>Liatris</i> spp.
Gazania, Treasure Flower	<i>Gazania rigens</i>
Gazania, Trailing	<i>Gazania rigens leucolaena</i>
Gloxinia	<i>Gloxinia simningia</i>
Kale, Ornamental	<i>Brassica napus</i>
Marigold, African	<i>Tagetes erecta</i>
Moss Rose*	<i>Portulaca grandiflora</i>
Mum, Garden	<i>Chrysanthemum</i> spp.
Periwinkle*	<i>Vinca major</i>
Periwinkle, Rose	<i>Catharanthus roseus</i>
Petunia*	<i>Petunia</i> spp.
Plumosa Cockscomb	<i>Celosia cristata</i>
Portulaca*	<i>Portulaca grandiflora</i>
Salvia*	<i>Salvia splendens</i>
Snapdragon	<i>Antirrhinum majus</i>
Statice*	<i>Limonium</i> spp.
Sweet William	<i>Dianthus barbatus</i>
Vinca*	<i>Vinca major</i>

\* Do not apply UP-End sooner than four weeks after transplanting for these annuals. Use the lower labeled rate.

UP-End herbicide may be used on plant species not listed on this label. Determine the suitability for such uses by treating a small number of such plants at the specified rate. Evaluate treated plants 1-2 months following treatment for possible injury.

## STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

**PESTICIDE STORAGE:** DO NOT STORE BELOW 15° F. Extended storage at temperatures below 15° F can result in the formation of crystals on the bottom of container. If crystallization does occur, store the container on its side at room temperature (70° F) and rock occasionally until crystals dissolve.

**PESTICIDE DISPOSAL:** Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

**CONTAINER DISPOSAL:** Nonrefillable container. Do not reuse or refill this container. Clean container promptly after emptying. Triple rinse after emptying, then offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures approved by state and local authorities.

Containers less than or equal to 5 gallons: triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a rinse tank, or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

Containers larger than 5 gallons: triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank, or store rinsate for later use or disposal. Repeat this procedure two more times.

### IMPORTANT INFORMATION READ BEFORE USING PRODUCT

#### CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

**NOTICE:** Read the entire Directions for Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using this product. If the terms are not acceptable, return the product at once, unopened, and the purchase price will be refunded.

The Directions for Use of this product reflect the opinion of experts based on field use and tests, and must be followed carefully. It is impossible to eliminate all risks associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as manner of use or application, weather or crop conditions, presence of other materials or other influencing factors in the use of the product, which are beyond the control of United Phosphorus, Inc. or Seller. Handling, storage, and use of the product by Buyer or User are beyond the control of United Phosphorus, Inc. and Seller. All such risks shall be assumed by Buyer and User, and Buyer and User agree to hold United Phosphorus, Inc. and Seller harmless for any claims relating to such factors.

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Rev. 12/21/09



**URGENT - 70506=EGN - CSF issues**

Kathryn Montague to: rebecca.clemmer

Cc: Dan Kenny, Hope Johnson

07/12/2010 04:15 PM

Hi, Ms. Clemmer,

I'm finalizing the review of your pending product, and there are a few errors on your CSFs that apparently were not communicated to you earlier today:

1. There are no upper and lower certified limits for the pure ai in boxes 14a and 14b on both CSFs.
2. There is no entry in box 9 for flash point/flame extension on either CSF (if N/A, you must state that)
3. The CAS no. for one of the reaction impurities is incorrect on the basic CSF.

Due to these errors, the product chemist was unable to make a determination regarding the substantial similarity of your product to the cited product, 241-416. As soon as I receive the revised CSFs, I will have the chemist complete the substantial similarity determination and finish the review of your product. Please feel free to call me if you have any questions.

Best Regards,  
Kay

Kathryn V. Montague  
Product Manager 23  
OPPTS/OPP/RD/HB  
1200 Pennsylvania Ave., NW  
Mailcode 7505P  
Washington, DC 20460  
Phone: (703)305-1243

## Telecommunication with United Phosphorus, Inc.

1. Called Rebecca Clemmer 7/6/2010 + left message to call me about 70506-EGN.
2. Called Rebecca Clemmer 7/7/2010 + left message to call me about 70506-EGN. Technician is not registered, so either need to withdraw application or replace technician with EPA Reg. No. 70506-EEO with a registered tech.
3. Called Rebecca Clemmer + sent E-mail 7/12/2010. After some discussion, she sent a different Technician + CSF + formulator exemption for tech.

FEE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

OPPTS/OPP/RD/TRB/PRODUCT CHEMISTRY TEAM

WASHINGTON, D.C. 20460

DATE OUT: June 9, 2010

SUBJECT: FEE: Product Chemistry Review of the EP, 'Up-end Herbicide'  
Reg No: 70506-EGN Barcode #: 376187 Decision #: 425342  
PC Code(s): 108501 Food Use: No

FROM: Linda L. Kutney, Chemist *Linda L. Kutney*  
Product Chemistry Team  
Technical Review Branch/RD (7505P) *6-9-10*

*8/10 6/10/10*

TO: James Tompkins, Philip Errico, RM-25  
Herbicide Branch/ RD (7505P)

INTRODUCTION:

The Registrant, United Phosphorus, Inc, has submitted product chemistry data to support registration of their new end use product, Up-end Herbicide, submitted under MRID 479415-01, -02 and -03. The label claim for this product is 38.7% pendimethalin. There are no food uses proposed for this product. A new basic and alternate CSF, dated 12-16-09, was proposed.

The Registrant has claimed substantial similarity between the product chemistry of their new product and the one having Reg No 241-416.

SUMMARY OF FINDINGS:

1. The nominal concentration of the ai(s) in the proposed CSF agrees with the label claim (PRN 91-2 is satisfied).
2. All inert components of the CSF are approved for the proposed use(s).
3. The physical chemical hazard and storage and disposal statements on the label are appropriate.
4. The enforcement analytical method is an HPLC method (479415-03).
5. All requirements specified in 40CFR 152.43 for alternate formulations have been satisfied.



#### TRB CONCLUSIONS:

1. The basic and alternate CSFs (dated 12-16-09) are not acceptable because they do not provide upper and lower certified limits for the pure ai in boxes 14a and 14b; there is no entry for flash point/flame extension in box 9; and the CAS number for the reaction by-product in the basic CSF is not correct.
2. The substantial similarity of the product chemistry of the proposed product to the product having Reg No 241-416 will be evaluated when the revised CSFs are received.
3. Product chemistry Group A data are acceptable for data concerning materials used to produce the product, formulation process, impurity formation, certified limits, and enforcement method -Guidelines 830.1600, 830.1650, 830.1670, 830.1750, 830.1800, respectively.
4. Product chemistry Group A data are not acceptable for certified limits -Guideline 830.1670.
5. Except for storage stability / corrosion studies, Guidelines 830.6317 / 830.6320, which are in progress and must be submitted upon their completion, the remaining product chemistry Group B data fulfill the data requirements.

PRODUCT CHEMISTRY DATA (Group A & Group B)

Group A, Requirement 830.- -:	<u>Are the Data Acceptable?</u>	<u>MRID</u>
1550. Chemical Identity(CSF)	NO	CSF
1600. Beginning Materials	Yes	479415-01
1650. Formulation Process	Yes	479415-01
1670. Discussion of Impurities	Yes	479415-01
1750. Certified Limits(CSF)	NO	CSF
1800 Enforcement Analytical Method	Yes	479415-03

<u>Group B.</u> <u>Guideline 830.-:</u>	<u>Are</u> <u>the</u> <u>Data</u> <u>accept</u> <u>able?</u>	<u>Description</u>	<u>MRID</u>
6302 Color	Yes	Yellow-orange	479415-02
6303 Physical State	Yes	Liquid	479415-02
6304 Odor	Yes	Faint	479415-02
6314 Oxidation/Reduction	Yes	No oxidizing or reducing properties.	479415-02
6315 Flammability/Flame Extension	Yes	Not flammable	479415-02
6316 Explodability	Yes	Not reported to contain explosive components.	479415-02
6317 Storage Stability	NO	Study in progress.	479415-02
6319 Miscibility	Yes	NA. Not mixed with petroleum solvents.	479415-02
6320 Corrosion Characteristics	NO	Study in progress.	479415-02
6321 Dielectric Breakdown Voltage	Yes	Not used around electrical equipment.	479415-02
7000 pH	Yes	7.72	479415-02
7100 Viscosity	Yes	423.9 cP (mPa-s) @ 20C	479415-02
7300. Density/Bulk Density	Yes	1.1705 @ 20C	479415-02

Explanations: NA = Not Applicable

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Pages   32   through   33   are not included in this copy.

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The material not included contains the following type of information:

       Identity of product inert ingredients.

       Identity of product impurities.

       Description of the product manufacturing process.

       Description of quality control procedures.

       Identity of the source of product ingredients.

       Sales or other commercial/financial information.

       A draft product label.

  X   The product confidential statement of formula.

       Information about a pending registration action.

       FIFRA registration data.

       The document is a duplicate of page(s)       .

       The document is not responsive to the request.

       Proprietary information pertaining to the chemical composition of an inert ingredient provided by the source of the ingredient.

       Attorney-Client Privilege.

       Claimed Confidential by submitter upon submission to the Agency.

       Internal Deliberative Information.

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\* The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

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# DATA PACKAGE BEAN SHEET

Date: 06-Apr-2010

Page 1 of 2

Decision #: 425342

DP #: (376187)

PRIA

Parent DP #:

Submission #: 864630

## \*\*\* Registration Information \*\*\*

Registration: 70506-EGN - UP-END HERBICIDE

Company: 70506 - UNITED PHOSPHORUS, INC

Risk Manager: RM 25 - James Tompkins - (703) 305-5697 Room# PY1 S-7337

Risk Manager Reviewer: Philip Errico PERRIC02

Sent Date: \_\_\_\_\_

Calculated Due Date: 12-Jul-2010

Edited Due Date: \_\_\_\_\_

Type of Registration: Product Registration - Section 3

Action Desc: (R310) NEW PRODUCT;NON-FAST TRACK (INCLUDES REVIEWS OF PRODUCT CHEMIST

Ingredients: 108501, Pendimethalin(38.7%)

*R310*  
*26789*

## \*\*\* Data Package Information \*\*\*

Expedite: ☐ Yes ☒ No

Date Sent: 06-Apr-2010

Due Back: \_\_\_\_\_

DP Ingredient: 108501, Pendimethalin

DP Title: New registration for Up-End Herbicide

CSF Included: ☒ Yes ☐ No

Label Included: ☒ Yes ☐ No

Parent DP #: \_\_\_\_\_

Assigned To

Date In

Date Out

Organization: RO / TRB

Last Possible Science Due Date: 12-Jun-2010

Team Name: CHEM

Science Due Date: \_\_\_\_\_

Reviewer Name: \_\_\_\_\_

Sub Data Package Due Date: \_\_\_\_\_

Contractor Name: \_\_\_\_\_

## \*\*\* Studies Sent for Review \*\*\*

Printed on Page 2

## \*\*\* Additional Data Package for this Decision \*\*\*

No Additional Data Packages

## \*\*\* Data Package Instructions \*\*\*

PRIA Action:

Please review product chemistry studies, and provide opinion whether data satisfies data requirements.  
Thanks.

Phil Errico 305-6663

*Sub Sum 241-416*

DP#: (376187)

\*\*\* Studies Sent for Review \*\*\*

Decision#: (425342)

MRID	MRID Status	Citation Reference	Guideline
47941502		Clemmer, R. (2009) UP-End Herbicide: Physical/Chemical Properties. Project Number: UPI/2009/009, 9192, 9194. Unpublished study prepared by Jai Research Foundation. 105 p.	830.7300/Density/relative density
47941501		Clemmer, R. (2009) UP-End Herbicide: Product Identity, Composition and Analysis. Project Number: UPI/2009/008. Unpublished study prepared by United Phosphorus, Inc. 53 p.	830.1550/Product Identity and composition
47941501		Clemmer, R. (2009) UP-End Herbicide: Product Identity, Composition and Analysis. Project Number: UPI/2009/008. Unpublished study prepared by United Phosphorus, Inc. 53 p.	830.1750/Certified limits
47941502		Clemmer, R. (2009) UP-End Herbicide: Physical/Chemical Properties. Project Number: UPI/2009/009, 9192, 9194. Unpublished study prepared by Jai Research Foundation. 105 p.	830.6304/Odor
47941501		Clemmer, R. (2009) UP-End Herbicide: Product Identity, Composition and Analysis. Project Number: UPI/2009/008. Unpublished study prepared by United Phosphorus, Inc. 53 p.	830.1800/Enforcement analytical method
47941502		Clemmer, R. (2009) UP-End Herbicide: Physical/Chemical Properties. Project Number: UPI/2009/009, 9192, 9194. Unpublished study prepared by Jai Research Foundation. 105 p.	830.6303/Physical state
47941502		Clemmer, R. (2009) UP-End Herbicide: Physical/Chemical Properties. Project Number: UPI/2009/009, 9192, 9194. Unpublished study prepared by Jai Research Foundation. 105 p.	830.7000/pH of water solutions or suspensions
47941503		Vohra, H. (2009) Validation of Analytical Method for Active Ingredient Analysis of Pendimethalin CS Herbicide (A.I. 38.7% w/w - 1 Gallon Contains 3.8 Pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) by HPLC. Project Number: 9196. Unpublished study prepared by Jai Research Foundation. 46 p.	830.1800/Enforcement analytical method
47941501		Clemmer, R. (2009) UP-End Herbicide: Product Identity, Composition and Analysis. Project Number: UPI/2009/008. Unpublished study prepared by United Phosphorus, Inc. 53 p.	830.1600/Description of materials used to produce the product
47941501		Clemmer, R. (2009) UP-End Herbicide: Product Identity, Composition and Analysis. Project Number: UPI/2009/008. Unpublished study prepared by United Phosphorus, Inc. 53 p.	830.1670/Discussion of formation of impurities
47941502		Clemmer, R. (2009) UP-End Herbicide: Physical/Chemical Properties. Project Number: UPI/2009/009, 9192, 9194. Unpublished study prepared by Jai Research Foundation. 105 p.	830.7100/Viscosity
47941501		Clemmer, R. (2009) UP-End Herbicide: Product Identity, Composition and Analysis. Project Number: UPI/2009/008. Unpublished study prepared by United Phosphorus, Inc. 53 p.	830.1650/Description of formulation process
47941502		Clemmer, R. (2009) UP-End Herbicide: Physical/Chemical Properties. Project Number: UPI/2009/009, 9192, 9194. Unpublished study prepared by Jai Research Foundation. 105 p.	830.6302/Color
47941501		Clemmer, R. (2009) UP-End Herbicide: Product Identity, Composition and Analysis. Project Number: UPI/2009/008. Unpublished study prepared by United Phosphorus, Inc. 53 p.	830.1620/Description of production process



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

Office of Chemical Safety and  
Pollution Prevention

April 27, 2010

MEMORANDUM

Subject: Name of Pesticide Product: UP-End Herbicide  
EPA File Symbol: 70506-EGN  
DP Barcode: D376189  
Decision No.: 425342  
Action Code: R310  
PC Code: 108501 Pendimethalin

From: Breann Hanson, Biologist *BHanson*  
Alternative Risk Integration and Assessment (ARIA) Team  
Risk Integration, Minor Use, Emergency Response Branch (RIMUERB)  
Registration Division (RD; 7505P)

Through: Masih Hashim, Team Leader – Toxicology *M Hashim*  
Technical Review Branch  
RD; 7505P

To: Phillip Errico, RM Team 25  
Herbicide Branch  
Registration Division (7505P)

Applicant: United Phosphorus, Inc.  
630 Freedom Business Center  
King of Prussia, PA 19406

FORMULATION FROM LABEL:

<u>Active Ingredient:</u>			<u>% by wt</u>
108501	Pendimethalin	CAS No. 40487-42-1	38.7
<u>Other Ingredients:</u>			61.3
			Total: 100.0%



**ACTION REQUESTED:** The Risk Manager requests: "Please review acute toxicity studies, and provide opinion whether study results satisfy data requirements. Thanks."

**BACKGROUND:** United Phosphorus, Inc. (herein the "registrant") has submitted acute oral, acute dermal, acute inhalation, primary eye irritation, primary skin irritation and dermal sensitization studies (MRIDs 479415-04 through -09) in support of their registration for UP-End Herbicide, EPA File Symbol: 70506-EGN. The studies were performed at Jai Research Foundation, Gujarat, India. Included in the data package were the studies, basic CSF (dated 12/16/2009), alternate CSF, proposed label and letter from the registrant.

**COMMENTS AND RECOMMENDATIONS:**

1. The six studies have been reviewed and are classified as Acceptable.
2. The acute toxicity profile for UP-End Herbicide, EPA File Symbol: 70506-EGN, is as follows:

Acute oral toxicity	IV	Acceptable	MRID 47941504
Acute dermal toxicity	IV	Acceptable	MRID 47941505
Acute inhalation toxicity	IV	Acceptable	MRID 47941506
Acute eye irritation	IV	Acceptable	MRID 47941507
Primary skin irritation	IV	Acceptable	MRID 47941508
Dermal sensitization	Negative	Acceptable	MRID 47941509

3. Based on the toxicity profile above, the following are the precautionary and first aid statements for this product as obtained from the Label Review System:

**PRODUCT ID #:** 070506-00230  
**PRODUCT NAME:** UP-End Herbicide

**PRECAUTIONARY STATEMENTS**

**SIGNAL WORD:** [None required, registrant may choose to use the signal word **CAUTION**]

**Hazards to Humans and Domestic Animals:** [Precautionary statements not required. Registrant may choose to include Toxicity Category III precautionary statements.] Wear: Long-sleeved shirt and long pants, socks and shoes.

**First Aid:** [None required. Registrant may choose to include first aid statements.]

4. No changes are required on the proposed label.
5. The basic CSF (dated 12/16/2009) for the proposed product has been cleared by the TRB Product Chemistry Team (12/30/2009). The technical active ingredient, 70506-EEO, in this end-use product is not yet registered with the Agency. The technical must be registered prior to registration of the end-use product, 70506-EGN.

Reviewer: Breann Hanson  
Risk Manager (EPA): Phillip Errico, RM 25

Date: April 27, 2010

**STUDY TYPE:** Acute Oral Toxicity - Rat; OPPTS 870.1100; OECD 425

**TEST MATERIAL:** Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) (Pendimethalin: 39% w/w; Batch No.: RD/PEND/38.7/CS/0809/1; dark orange aqueous capsule suspension with faint odor; pH: 7.75)

**CITATION:** Verma, R. (2009) Acute Oral Toxicity Study of Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) in Rats. JRF Study Number: 9172. Unpublished study prepared by JAI Research Foundation. October 22, 2009. MRID 47941504.

**SPONSOR:** United Phosphorus, Inc., 630 Freedom Business Center, King of Prussia, PA 19406

**EXECUTIVE SUMMARY:** In an acute oral toxicity study (MRID 47914504), a total of 3 young adult female rats (age: 10-11 weeks; weight: 167-174 g; source: Animal Breeding Facility, JRF, India; strain: Wistar) were given a single oral dose of Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) (Pendimethalin: 39% w/w; Batch No.: RD/PEND/38.7/CS/0809/1; dark orange aqueous capsule suspension with faint odor; pH: 7.75), prepared in distilled water, by gavage at a limit dose of 5000 mg/kg bw, according to the Up and Down Procedure. Initially, a single test animal was dosed at 5000 mg/kg bw; due to this test animal surviving, the test was completed with two additional test animals dosed at 5000 mg/kg bw. Test animals were dosed one at a time. Individual body weights were recorded prior to dosing (study day 0) and again on study days 7 and 14. The test animals were observed for mortality and clinical signs of toxicity at 30 minutes, 1, 2, 3, 4 and 6 hours post-dosing on study day 0 and at least once daily thereafter for the remainder of the 14 day study period. All test animals were necropsied.

All 3/3 test animals dosed at 5000 mg/kg bw survived, gained weight, and did not exhibit signs of toxicity at any point during the study period. No gross internal findings were observed at necropsy.

Oral LD<sub>50</sub> Females > 5000 mg/kg bw

**Based on the observed LD<sub>50</sub> in females, Pendimethalin CS Herbicide is classified as EPA Toxicity Category IV.**

This acute oral study is classified as Acceptable. It does satisfy the guideline requirement for an acute oral study (OPPTS 870.1100; OECD 425) in the rat.

**COMPLIANCE:** Signed and dated GLP, Quality Assurance, and Data Confidentiality statements were provided.

**RESULTS and DISCUSSION:** Individual animals were dosed as follows:

**Main Test**

Dosing Sequence	Animal No.	Dose level (mg/kg)	Short-Term Outcome	Long-Term Outcome
1	1	5000	S	S
2	2	5000	S	S
3	3	5000	S	S

S = survival    D = death

Initially, a single test animal was dosed at 5000 mg/kg bw; due to this test animal surviving, the test was completed with two additional test animals dosed at 5000 mg/kg bw. Test animals were dosed one at a time.

**Statistics:** Acute Oral Toxicity (Guideline 425) Statistical Program (Westat, version 1.0, May 2001) was used for all data analyses including: dose progression selections, stopping criteria determinations and/or LD<sub>50</sub> and confidence limit calculations.

AOT425statpgm (Version: 1.0) Test Results and Recommendations  
Acute Oral Toxicity (OECD Test Guideline 425) Statistical Program  
Date/Time: Monday, April 26, 2010, 10:18:01 AM  
Data file name: work.dat  
Last modified: 4/26/2010 10:18:01 AM  
Test/Substance: UP-End Herbicide  
Test type: Limit Test  
Limit dose (mg/kg): 5000  
Assumed LD50 (mg/kg): Default  
Assumed sigma (mg/kg): 0.5

**DATA:**

Test Seq.	Animal ID	Dose (mg/kg)	Short-term Result	Long-term Result
-----------	-----------	--------------	-------------------	------------------

1	1	5000	O	O
2	2	5000	O	O
3	3	5000	O	O

(X = Died, O = Survived)

Dose Recommendation: The limit test is complete.

**SUMMARY OF LONG-TERM RESULTS:**

Dose	O	X	Total
5000	3	0	3
All Doses	3	0	3

Statistical Estimates: The LD50 is greater than 5000 mg/kg.

A. **Mortality**: None; all test animals survived.

B. **Clinical observations**: All test animals gained weight and did not exhibited signs of toxicity at any point during the study period.

C. **Gross Necropsy**: No gross internal findings were observed at necropsy.

D. **Reviewer's Conclusions**: This reviewer agrees with the study author's conclusions. Based on the LD<sub>50</sub> in females, Pendimethalin CS Herbicide is classified as EPA Toxicity Category IV.

E. **Deficiencies**: None.

Reviewer: Breann Hanson  
Risk Manager (EPA): Phillip Errico, RM 25

Date: April 27, 2010

**STUDY TYPE:** Acute Dermal Toxicity - Rat; OPPTS 870.1200; OECD 402

**TEST MATERIAL:** Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) (Pendimethalin: 39% w/w; Batch No.: RD/PEND/38.7/CS/0809/1; dark orange aqueous capsule suspension with faint odor; pH: 7.75)

**CITATION:** Verma, R. (2009) Acute Dermal Toxicity Study of Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) in Rats. JRF Study Number: 9173. Unpublished study prepared by JAI Research Foundation. October 21, 2009. MRID 47941505.

**SPONSOR:** United Phosphorus, Inc., 630 Freedom Business Center, King of Prussia, PA 19406

**EXECUTIVE SUMMARY:** In an acute dermal toxicity study (MRID 47941505), 5/sex rats (age: 11-12 weeks; weight: 256-294 g males, 214-237 g females; source: Animal Breeding Facility, JRF, India; strain: Wistar) were dermally exposed to Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) (Pendimethalin: 39% w/w; Batch No.: RD/PEND/38.7/CS/0809/1; dark orange aqueous capsule suspension with faint odor; pH: 7.75) at a limit dose of 5000 mg/kg bw. An additional group of 5/sex rats were treated with distilled water, and served as a control. The test substance was applied over the dose area on the dorsal lumbar area, covering approximately 10% of the body surface area, covered with a gauze dressing, secured with non-irritating tape and left in place for 24 hours. Individual body weights were recorded prior to dosing (study day 0) and again on study days 7 and 14. The test animals were observed for mortality and clinical signs of toxicity at 1, 2, 3 and 5 hours post-application on study day 0 and at least once daily thereafter for the remainder of the 14 day study period. All animals were necropsied.

All 10/10 control animals survived, gained weight and did not exhibit any signs of toxicity during the study period. At necropsy, one control animal exhibited a distended uterus. No gross internal findings were observed at necropsy for the remaining 9/10 control animals.

All 10/10 test animals dosed at 5000 mg/kg bw survived, gained weight comparable to controls and did not exhibit any signs of toxicity during the study period. No gross internal findings were observed at necropsy.

Dermal LD<sub>50</sub> Males > 5000 mg/kg bw  
Dermal LD<sub>50</sub> Females > 5000 mg/kg bw  
Dermal LD<sub>50</sub> Combined > 5000 mg/kg bw

**Based on the observed LD<sub>50</sub>, Pendimethalin CS Herbicide is classified as EPA Toxicity Category IV.**

This acute dermal study is classified Acceptable. It does satisfy the guideline requirement for an acute dermal study (OPPTS 870.1200; OECD 402) in the rat.

**COMPLIANCE:** Signed and dated GLP, Quality Assurance, and Data Confidentiality statements were provided.

**RESULTS and DISCUSSION:**

Dose (mg/kg bw)	Mortality/Number Tested		
	Males	Females	Combined
0	0/5	0/5	0/10
5000	0/5	0/5	0/10

The test substance was applied over the dose area on the dorsal lumber area, covering approximately 10% of the body surface area, covered with a gauze dressing, secured with non-irritating tape and left in place for 24 hours.

**Statistics:** The dermal LD<sub>50</sub> was observed as being > 5000 mg/kg bw.

**A. Mortality:** None; all 10/10 control and 10/10 test animals survived.

**B. Clinical observations:** All 10/10 control and 10/10 test animals gained (comparable) weight and did not exhibit any signs of toxicity during the study period.

**C. Gross Necropsy:** At necropsy, one control animal exhibited a distended uterus. No gross internal findings were observed at necropsy for the remaining 9/10 control or 10/10 test animals.

**D. Reviewer's Conclusions:** This reviewer agrees with the study author's conclusions. Based on the observed LD<sub>50</sub>, Pendimethalin CS Herbicide is classified as EPA Toxicity Category IV.

**E. Deficiencies:** None.

Reviewer: Breann Hanson  
Risk Manager (EPA): Phillip Errico, RM 25

Date: April 27, 2010

**STUDY TYPE:** Acute Inhalation Toxicity - Rat; OPPTS 870.1300; OECD 403

**TEST MATERIAL:** Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) (Pendimethalin: 39% w/w; Batch No.: RD/PEND/38.7/CS/0809/1; dark orange aqueous capsule suspension with faint odor; pH: 7.75)

**CITATION:** Verma, R. (2009) Acute Inhalation Toxicity Study of Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) in Rats. JRF Study Number: 9174. Unpublished study prepared by JAI Research Foundation. October 29, 2009. MRID 47941506.

**SPONSOR:** United Phosphorus, Inc., 630 Freedom Business Center, King of Prussia, PA 19406

**EXECUTIVE SUMMARY:** In an acute inhalation toxicity study (MRID 47914506), 5/sex rats (age: 9-10 weeks; weight: 198-254 g males, 163-188 g females; source: Animal Breeding Facility, JRF, India; strain: Wistar) were exposed head/nose via the inhalation route to Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) (Pendimethalin: 39% w/w; Batch No.: RD/PEND/38.7/CS/0809/1; dark orange aqueous capsule suspension with faint odor; pH: 7.75), generated as an aerosol, for 4 hours at a concentration of 5.39 mg/L. An additional group of 5/sex rats served as control and were exposed to air. Individual body weights were recorded prior to exposure (study day 0) and again on study days 7 and 14 post-exposure. The test animals were observed for mortality and clinical signs of toxicity hourly during the exposure period, 1-hour post-exposure and at least once daily thereafter for the remainder of the 14 day study period. All animals were necropsied.

All 10/10 control animals survived, gained body weight and exhibited no clinical signs of toxicity during the study period. At necropsy, one control animal exhibited a distended uterus. No gross internal findings were observed at necropsy for the remaining 9/10 control animals

All 10/10 test animals exposed to the test substance survived, gained body weight and exhibited no clinical signs of toxicity during the study period. No gross internal findings were observed at necropsy. The MMAD was 2.79  $\mu$ m and the GSD was 2.54.

LC<sub>50</sub> Males > 5.39 mg/L  
LC<sub>50</sub> Females > 5.39 mg/L  
LC<sub>50</sub> Combined > 5.39 mg/L

**Based on the observed LC<sub>50</sub>, Pendimethalin CS Herbicide is classified as EPA Toxicity Category IV.**

This acute inhalation study is classified as Acceptable. It does satisfy the guideline requirement for an acute inhalation study (OPPTS 870.1300; OECD 403) in the rat.

**COMPLIANCE:** Signed and dated GLP, Quality Assurance, and Data Confidentiality statements were provided.

**RESULTS and DISCUSSION:**

Nominal Conc. (mg/L)	Gravimetric Conc. (mg/L)	MMAD (µm)	GSD	Mortality/Number Tested		
				Males	Females	Combined
0	0	--	--	0/5	0/5	0/10
33.43	5.39	2.79	2.54	0/5	0/5	0/10

**Test Atmosphere / Chamber Description:** The test substance was infused into a spray atomizer, generating an aerosol, which was then distributed into the inhalation chamber.

Gravimetric Conc. (mg/L):	5.39
Chamber Volume (L):	63.5
Airflow (LPM):	20
Temperature (°C):	21.8-23.0
Relative Humidity (%):	32.1-69.1
Time to Equilibrium (min):	30
Oxygen Concentration (%)	20.6-21.9

**Test atmosphere concentration:** An open phase sampler with glass microfiber papers was used to assess gravimetric concentrations. Samples were collected from the breathing zone of the test animals every hour during exposure at a rate of 1.77 LPM. At the end of the exposure, the microfiber papers with the test substance were weighed to determine the concentration of test substance.

**Particle size determination:** Particle size was assessed using a seven-stage cascade impactor; the total mass of particles and the percent mass of particles in each size range was calculated. The MMAD was calculated directly from the percent particle size distribution.

**Statistics:** The inhalation LC<sub>50</sub> was observed as being greater than 5.39 mg/L.

**A. Mortality:** None; all 10/10 control and 10/10 test animals survived.

**B. Clinical observations:** All 10/10 control and 10/10 test animals gained body weight and exhibited no clinical signs of toxicity during the study period. The MMAD was 2.79 µm and the GSD was 2.54 in the test group.

**C. Gross Necropsy:** At necropsy, one control animal exhibited a distended uterus. No gross internal findings were observed at necropsy for the remaining 9/10 control or 10/10 test animals.



**D. Reviewer's Conclusions:** This reviewer agrees with the study author's conclusions. Based on the observed  $LC_{50} > 5.39$  mg/L, Pendimethalin CS Herbicide is classified as EPA Toxicity Category IV.

**E. Deficiencies:** None.

**Reviewer:** Breann Hanson  
**Risk Manager (EPA):** Phillip Errico, RM 25

**Date:** April 27, 2010

**STUDY TYPE:** Primary Eye Irritation - Rabbit; OPPTS 870.2400; OECD 405

**TEST MATERIAL:** Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) (Pendimethalin: 39% w/w; Batch No.: RD/PEND/38.7/CS/0809/1; dark orange aqueous capsule suspension with faint odor; pH: 7.75)

**CITATION:** Verma, R. (2009) Acute Eye Irritation Study of Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) in Rabbits. JRF Study Number: 9176. Unpublished study prepared by JAI Research Foundation. October 22, 2009. MRID 47941507.

**SPONSOR:** United Phosphorus, Inc., 630 Freedom Business Center, King of Prussia, PA 19406

**EXECUTIVE SUMMARY:** In a primary eye irritation study (MRID 47941507), 0.1 mL of Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) (Pendimethalin: 39% w/w; Batch No.: RD/PEND/38.7/CS/0809/1; dark orange aqueous capsule suspension with faint odor; pH: 7.75) was instilled into the conjunctival sac of one eye in three female young adult rabbits (source: Animal Breeding Facility, JRF, India; strain: New Zealand white). The contralateral eye served as a control and was treated with 0.1 mL normal saline. Initially, a single test animal was dosed; due to the lack of irritation at the 24-hour observation the test was completed with 2 additional test animals. The test animals were scored for irritation at approximately 1, 24, 48, and 72 hours post-instillation. Fluorescein dye was used at the 24-hour observation to verify the absence of corneal damage. At the 24-hour observation both eyes of all test animals were washed with normal saline. Irritation was scored based on accepted guidelines.

No corneal opacity or iritis was observed in any treated eye. One-hour post-instillation, 3/3 treated eyes exhibited redness (score 1-2). At the 24-hour observation, redness (score 1) persisted in all 3/3 treated eyes. No “positive” eye irritation was noted at 24-hours. Irritation cleared completely from all treated eyes by the 48-hour observation.

**Based on the lack of “positive” eye irritation at the 24-hour observation, Pendimethalin CS Herbicide is classified as EPA Toxicity Category IV for primary eye irritation.**

This study is classified as Acceptable. It does satisfy the guideline requirement for a primary eye irritation study (OPPTS 870.2400; OECD 405) in the rabbit.

**COMPLIANCE:** Signed and dated GLP, Quality Assurance, and Data Confidentiality statements were provided.

## RESULTS and DISCUSSION:

Observations	Number "positive"/number tested			
	Hours			
	1	24	48	72
Corneal Opacity	0/3	0/3	0/3	0/3
Iritis	0/3	0/3	0/3	0/3
Conjunctivae:				
Redness *	1/3	0/3	0/3	0/3
Chemosis *	0/3	0/3	0/3	0/3

\* Score of 2 or more required to be considered "positive."

**A. Observations:** No corneal opacity or iritis was observed in any treated eye. One-hour post-instillation, 3/3 treated eyes exhibited redness (score 1-2). At the 24-hour observation, redness (score 1) persisted in all 3/3 treated eyes. No "positive" eye irritation was noted at 24-hours. Irritation cleared completely from all treated eyes by the 48-hour observation.

**B. Results:** Pendimethalin CS Herbicide was practically non-irritating to the eye.

**C. Reviewer's Conclusions:** This reviewer agrees with the study author's conclusions. Pendimethalin CS Herbicide is classified as EPA Toxicity Category IV.

**D. Deficiencies:** None.

Reviewer: Breann Hanson  
Risk Manager (EPA): Phillip Errico, RM 25

Date: April 27, 2010

**STUDY TYPE:** Primary Dermal Irritation - Rabbit; OPPTS 870.2500; OECD 404

**TEST MATERIAL:** Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) (Pendimethalin: 39% w/w; Batch No.: RD/PEND/38.7/CS/0809/1; dark orange aqueous capsule suspension with faint odor; pH: 7.75)

**CITATION:** Verma, R. (2009) Acute Dermal Irritation Study of Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) in Rabbits. JRF Study Number: 9175. Unpublished study prepared by JAI Research Foundation. October 12, 2009. MRID 47941508.

**SPONSOR:** United Phosphorus, Inc., 630 Freedom Business Center, King of Prussia, PA 19406

**EXECUTIVE SUMMARY:** In a primary skin irritation study (MRID 47941508), 3 young adult male rabbits (source: Animal Breeding Facility, JRF, India; strain: New Zealand white) were dermally exposed to 0.5 mL of Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) (Pendimethalin: 39% w/w; Batch No.: RD/PEND/38.7/CS/0809/1; dark orange aqueous capsule suspension with faint odor; pH: 7.75). The test substance was applied evenly to the dose site on each test animal, covered with a gauze patch secured with non-irritating tape and held in place for 4 hours. Distilled water was applied to another dose site to serve as a control. Dermal irritation was scored based OECD 404 Guidelines at 1, 24, 48 and 72 hours post-patch removal.

No irritation was noted at any treated or control dermal dose site at any point during the study. The dermal irritation score was 0.0.

In this study, Pendimethalin CS Herbicide was non-irritating. **Based on the lack of irritation, Pendimethalin CS Herbicide is classified as EPA Toxicity Category IV for primary skin irritation.**

This study is classified as Acceptable. It does satisfy the guideline requirement for an acute primary skin irritation study (OPPTS 870.2500; OECD 404) in the rabbit.

**COMPLIANCE:** Signed and dated GLP, Quality Assurance, and Data Confidentiality statements were provided.

**RESULTS and DISCUSSION:**

**INDIVIDUAL SKIN IRRITATION SCORES  
ERYTHEMA/EDEMA**

Animal No.	Sex	Hours			
		1	24	48	72
1	M	0/0	0/0	0/0	0/0
2		0/0	0/0	0/0	0/0
3		0/0	0/0	0/0	0/0
Severity of Irritation - Mean Score		0/0	0/0	0/0	0/0

**A. Observations:** No irritation was noted at any treated or control dermal dose site at any point during the study.

**B. Results:** The dermal irritation score was 0.0.

**C. Reviewer's Conclusions:** This reviewer agrees with the study author's conclusions. Based on the lack of irritation, Pendimethalin CS Herbicide is classified as EPA Toxicity Category IV.

**D. Deficiencies:** None.

**Reviewer:** Breann Hanson  
**Risk Manager (EPA):** Phillip Errico, RM 25

**Date:** April 27, 2010

**STUDY TYPE:** Dermal Sensitization - Guinea Pig; OPPTS 870.2600; OECD 406

**TEST MATERIAL:** Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) (Pendimethalin: 39% w/w; Batch No.: RD/PEND/38.7/CS/0809/1; dark orange aqueous capsule suspension with faint odor; pH: 7.75)

**CITATION:** Verma, R. (2009) Skin Sensitization Study of Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) in Guinea Pigs. JRF Study Number: 9177. Unpublished study prepared by JAI Research Foundation. October 29, 2009. MRID 47941509.

**SPONSOR:** United Phosphorus, Inc., 630 Freedom Business Center, King of Prussia, PA 19406

**EXECUTIVE SUMMARY:** In a dermal sensitization study (MRID 47941509) with Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) (Pendimethalin: 39% w/w; Batch No.: RD/PEND/38.7/CS/0809/1; dark orange aqueous capsule suspension with faint odor; pH: 7.75), 15 male guinea pigs (Weight: 367-482 g; Source: Animal Breeding Facility, JRF, India; strain: Hartley) were tested according to the Magnusson-Kligman Design method.

During the preliminary testing phase, appropriate concentrations of the test substance to be used were determined for the intradermal induction (5.0% v/v test substance in distilled water), topical induction (undiluted) and for topical challenge (undiluted).

The first induction phase involved three 0.1 mL intradermal paired injections into 10 guinea pigs of 1) the test substance; 2) test substance in a 1:1 mixture with Freund's Complete Adjuvant (FCA) in distilled water; and of 3) FCA in distilled water. Paired injections were also administered to 5 control guinea pigs under the same conditions as in the treated group except that the test substance was omitted and replaced with distilled water. The sites were assessed for dermal irritation 24-hours post-injection according to Draize.

Seven days after the intradermal injections a second induction phase was conducted consisting of a topical application applied to the left flank of each test animal via a gauze patch containing 0.2 mL of test substance which was then held in place via an occlusive dressing for 48 hours. On the day prior, 0.5 mL of 10% sodium lauryl sulphate was applied to the dosing area to augment the local skin reactions. The control group was treated under the same conditions as in the test group, except that the test substance was omitted and replaced with 0.2 mL of distilled water. The sites were assessed 24-hours post-dressing removal for dermal irritation according to Draize.

On study day 21 the challenge phase was conducted consisting of topical applications applied to the right flank of both test and control animals of 0.2 mL of test substance which was then held in place via an occlusive dressing for 24 hours. At 24- and 48-hours post-dressing removal the degree of dermal irritation was assessed and recorded according to the Magnusson and Kligman grading scale.

Animals were observed twice daily and clinical signs of toxicity were recorded once daily. Body weights were recorded prior to testing and at study termination.

The procedures were validated using alpha-Hexylcinnamaldehyde as the positive control substance.

All 10/10 test and 5/5 control animals survived, gained weight and appeared healthy throughout the study period.

Following the intradermal induction phase, very slight to well-defined erythema (score 1-2) and very slight edema (score 1) were noted at all test treatment sites. Following the topical induction, very slight to well-defined erythema (score 1-2) was noted at all test treatment sites, while very slight edema (score 1) was noted at 6/10 test sites. No dermal irritation was noted at control sites.

At challenge, no positive skin responses were noted at any test or control treatment site. The sensitization response was 0%.

**Pendimethalin CS Herbicide does NOT have to be labeled as a dermal sensitizer.**

This study is classified as Acceptable. It does satisfy the guideline requirement for a primary dermal sensitization study (OPPTS 870.2600; OECD 406) in the Guinea pig.

**COMPLIANCE:** Signed and dated GLP, Quality Assurance, and Data Confidentiality statements were provided.

## **I. PROCEDURE**

**A. Preliminary Testing:** During the preliminary testing phase, appropriate concentrations of the test substance to be used were determined for the intradermal induction (5.0% v/v test substance in distilled water), topical induction (undiluted) and for topical challenge (undiluted).

**B. Induction:** The first induction phase involved three 0.1 mL intradermal paired injections into 10 guinea pigs. Paired injections were also administered to 5 control guinea pigs under the same conditions as in the treated group. The sites were assessed for dermal irritation 24-hours post-injection according to Draize.

A second induction phase was conducted consisting of a topical application applied to the left flank of each test animal via a gauze patch which was then held in place via an occlusive dressing for 48 hours. On the day prior, sodium lauryl sulphate was applied to the dosing area to augment the local skin reactions. The control group was treated under the same conditions as in the test group, except that the test substance was omitted and replaced with distilled water. The sites were assessed 24-hours post-dressing removal for dermal irritation according to Draize

**C. Challenge:** The challenge phase was conducted consisting of topical applications applied to the right flank of both the test and control animals of undiluted test substance, which was held in place via an occlusive dressing for 24 hours. At 24 and 48 hours post-dressing removal the

degree of dermal irritation was assessed and recorded according to the Magnusson and Kligman grading scale.

**D. Naive Controls:** A group of 5 naive control animals were treated under the same conditions as in the test group, except that the test substance was omitted and replaced with distilled water during the induction phases of the study.

## **II. RESULTS and DISCUSSION:**

**A. Reactions and duration:** Intradermal induction phase: very slight to well-defined erythema (score 1-2) and very slight edema (score 1) were noted at all test treatment sites. Topical induction: very slight to well-defined erythema (score 1-2) was noted at all test treatment sites, while very slight edema (score 1) was noted at 6/10 test sites. No dermal irritation was noted at control sites.

At challenge, no positive skin responses were noted at any test or control treatment site. The sensitization response was 0%.

**B. Positive control:** Positive control data was submitted that indicates the laboratory can produce a positive result with a known sensitizer, alpha-Hexylcinnamaldehyde. At challenge, 60% of the positive test animals exhibited signs of skin sensitization at 24- and 48-hours. The positive control study was completed in July 2009. This study, conducted with the test substance, was completed in October 2009.

**C. Reviewer's Conclusions:** Agree with study author that the test substance is not a dermal sensitizer.

**D. Deficiencies:** None.



**ACUTE TOX ONE-LINERS:**

<b>1. DP BARCODE:</b>	376189			
<b>2. PC CODE:</b>	108501			
<b>3. CURRENT DATE:</b>	27/APRIL/2010			
<b>4. TEST MATERIAL:</b>	Pendimethalin CS Herbicide (A.I. 38.7% w/w – 1 Gallon Contains 3.8 pounds of Pendimethalin Formulated as an Aqueous Capsule Suspension) (Pendimethalin: 39% w/w; Batch No.: RD/PEND/38.7/CS/0809/1; dark orange aqueous capsule suspension with faint odor; pH: 7.75)			
Study/Species/Lab Study # /Date	MRID	Results	Tox. Cat.	Core Grade
Acute oral toxicity / rat JAI Research Foundation 9172 10/22/2009	47941504	Oral LD <sub>50</sub> Females > 5000 mg/kg bw	IV	A
Acute dermal toxicity / rat JAI Research Foundation 9173 10/21/2009	47941505	Dermal LD <sub>50</sub> > 5000 mg/kg bw (males and females)	IV	A
Acute inhalation toxicity / rat JAI Research Foundation 9174 10/29/2009	47941506	Inhalation LC <sub>50</sub> > 5.39 mg/L (males and females)	IV	A
Primary eye irritation / rabbit JAI Research Foundation 9176 10/22/2009	47941507	No corneal opacity or iritis. At 1-hour: 3/3 eyes exhibited redness (score 1-2). At 24-hours: redness (score 1) still noted in all 3/3 eyes. No "positive" eye irritation was noted at 24-hours. Irritation cleared completely from all treated eyes by the 48-hour observation.	IV	A
Primary dermal irritation / rabbit JAI Research Foundation 9175 10/12/2009	47941508	No irritation.	IV	A
Dermal sensitization / guinea pig JAI Research Foundation 9177 10/29/2009	47941509	Negative.	--	A

**Core Grade Key: A =Acceptable, S = Supplementary, U = Unacceptable, W = Waived**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

January 4, 2010

OFFICE OF  
PREVENTION, PESTICIDES AND  
TOXIC SUBSTANCES

UNITED PHOSPHORUS, INC  
630 FREEDOM BUSINESS CENTER, SUITE 402  
KING OF PRUSSIA, PA 19406-

Report of Analysis for Compliance with PR Notice 86-5

Thank you for your submittal of 22-DEC-09. Our staff has completed a preliminary analysis of the material. The results are provided as follows:

Your submittal was found to be in full compliance with the standards for submission of data contained in PR Notice 86-5. A copy of your bibliography is enclosed, annotated with Master Record ID's (MRIDs) assigned to each document submitted. Please use these numbers in all future references to these documents. Thank you for your cooperation. If you have any questions concerning this data submission, please raise them with the cognizant Product Manager, to whom the data have been released.

# Receipt for Section 3

S: 884630

Resubmission: ☐ Yes ☒ No

Regulatory Type: Product Registration - Section 3

Fee For Service: ☒ Yes ☐ No

Application Type: New Registration

Billable: ☒ Yes ☐ No

Company: 70506 UNITED PHOSPHORUS, INC V

Print Letter

Enter More Information

Tracking

Risk Manager: Registration Division Risk Management Team 25

Product #: 70506 EGN Product Name: UP-END HERBICIDE

Override#

Me Too Section 3: 241-416 Me Too Product Name: PENDULUM CS HERBICIDE

Application Date: 22-Dec-2009 OPP Rec'd Date: 22-Dec-2009

Front End Date: 29-Dec-2009 Risk Manager Send Date:

FFS Due Date: Negotiated Due Date:

OPP Target Date:

Fast Track: ☐ New Ingredient: ☐

Receipt Description:

Application for registration

New Ingredient Request Date:

New Ingredient Received Date:

Form A: ☐ Signature Date: Form B: ☐ Signature Date:

Receipt Content	
Study	
CSF	

View/Edit



## United Phosphorus, Inc.

630 Freedom Business Center  
Suite 402  
King of Prussia, PA 19406  
(610) 491-2828 (phone)  
(610) 491-2810 (fax)

Rebecca A. Clemmer  
Regulatory Manager

Jim Tompkins (PM 25)  
Document Processing Desk (REG)  
Office of Pesticide Programs (7504P)  
U.S. Environmental Protection Agency  
Room S-4900, One Potomac Yard  
2777 S. Crystal Drive  
Arlington, VA 22202

Dec. 22, 2009

Re: Application for registration: UP-End Herbicide

Dear Mr. Tompkins:

United Phosphorus, Inc. is applying for registration of UP-End Herbicide, manufactured from the unregistered technical UPI Pendimethalin Technical (application for registration dated 12/14/09; EPA File Symbol 70506-EEO) for nonfood uses only. This label is a me-too of the BASF product Pendulum AquaCap (EPA Reg. No. 241-416).


In support of this application, enclosed please find the following:

- Application for Pesticide Registration (EPA Form 8570-1).
- Confidential Statement of Formula dated December 16, 2009.
- Data matrix forms - Agency Use and Public File copies (EPA Form 8570-35).
- Five (5) copies of the proposed labeling.
- EPA form 8570-34, Certification with Respect to Offers to Pay, using the selective cite-all method to satisfy data requirements other than product specific data.
- Copy of the letter accompanying payment of the PRIA fee.
- Transmittal document.
- Three (3) copies of reports for product specific data listed in the attached Transmittal Document.

This action should fall within the PRIA category R310 "New end-use or manufacturing-use product, requires review of data package within RD" with a PRIA fee of \$4578.

Please contact me if you have any questions.

Very truly yours,

  
Rebecca A. Clemmer  
[rebecca.clemmer@uniphos.com](mailto:rebecca.clemmer@uniphos.com)

## TRANSMITTAL DOCUMENT

### Submitter

United Phosphorus, Inc.  
630 Freedom Business Center, Suite 402, King of Prussia, PA 19406  
Company Number 70506

### Regulatory action in support of which this package is submitted

Application for Registration of UP-End Herbicide

Transmittal Date: December 22, 2009

### Submitted Studies

MRID	Title	Guideline
47941501	UP-End Herbicide -- Product Identity, Composition, and Analysis. United Phosphorus, Inc. December 22, 2009. UPI Report Number UPI-2009-008. 53 p.	Series 830
47941502	UP-End Herbicide -- Physical/Chemical Properties. United Phosphorus, Inc. December 14, 2009. UPI Compilation Report No. UPI-2009-009 105 p.	Series 830
47941503	Validation of Analytical Method for Active Ingredient Analysis of Pendimethalin CS Herbicide by HPLC. Jai Research Foundation, Oct. 3, 2009. JRF Study 9196, 46 p.	830.1700 830.1800
47941504	Acute Oral Toxicity Study of Pendimethalin CS Herbicide in Rats. Jai Research Foundation, Oct. 22, 2009. JRF Study 9172. 39 p.	870.1100
47941505	Acute Dermal Toxicity Study of Pendimethalin CS Herbicide in Rats. Jai Research Foundation, Oct. 21, 2009. JRF Study 9173. 42 p.	870.1200
47941506	Acute Inhalation Toxicity Study of Pendimethalin CS Herbicide in Rats. Jai Research Foundation, Oct. 29, 2009. JRF Study 9174. 55 p.	870.1300
47941507	Acute Eye Irritation Study of Pendimethalin CS Herbicide in Rabbits. Jai Research Foundation, Oct. 22, 2009. JRF Study 9176. 39 p.	870.2400
47941508	Acute Dermal Toxicity Study of Pendimethalin CS Herbicide. Jai Research Foundation, Oct. 12, 2009. JRF Study 9175. 39 p.	870.2500
47941509	Skin Sensitization Study of Pendimethalin CS Herbicide in Guinea Pigs (Guinea Pig Maximization Test). Jai Research Foundation, Oct. 29, 2009. JRF Study 9177. 57 p.	870.2600

# PRIA 2 – 21 Day Content Screen Review Worksheet (EPA/OPP Use Only)

3/23/09

21 Day Screen Start Date: 12-22-09

Experts In-Processing Signature: M F HARRINGTON Date 12-30-09 Fee Paid: Yes ☒

Division management contacted on issues No ☐ Yes ☐ Date \_\_\_\_\_

EPA Reg. Number: <u>70506-EGN</u>		EPA Receipt Date: <u>12-22-09</u>				
Items for Review			Yes	No	N/A*	
1	Application Form (EPA Form 8570-1)(link to form) signed & complete including package type			X		
2	Confidential Statement of Formula all boxes completed, form signed, and dated (EPA Form 8570-4) (Link to form)			X		
	a) All inerts (link to <a href="http://www.epa.gov/opprd001/inerts/">http://www.epa.gov/opprd001/inerts/</a> ), including fragrances, approved for the proposed uses (see Footnote A)	yes	no			
3	Certification with Respect to Citation of Data (EPA Form 8570-34) (Link to form) completed and signed (N/A if 100% repack)			X		
	Certificate and data matrix consistent			X		
	If applicant is relying on data that are compensable, is the offer to pay statement included. (see Footnote B)	yes	no			
	If applicable, is there a letter of Authorization for exclusive use only.					
4	Formulator's Exemption Statement (EPA Form 8570-27) (Link to form) completed and signed (N/A if source is unregistered or applicant owns the technical)					X
5	Data Matrix (EPA Form 8570-35) (Link to form) both internal and external copies (PR 98-5) (Link to PR 98-5) completed and signed (N/A if 100% repack)			X		
	a) Selective Method (Fee category experts use)	yes	no			
	b) Cite-All (Fee category experts use)					
	c) Applicant owns all data (Fee category experts use)					
6	5 Copies of Label (link to <a href="http://www.epa.gov/oppfead1/labeling/lrm/">http://www.epa.gov/oppfead1/labeling/lrm/</a> ) (Electronic labels on CD are encouraged and guidance is available)( link to <a href="http://www.epa.gov/pesticides/regulating/registering/submissions/index.htm#labels">http://www.epa.gov/pesticides/regulating/registering/submissions/index.htm#labels</a> )			X		

7	Is the data package consistent with PR Notice 86-5 (link to PRN 86-5)	X		
8	Notice of Filing (link to <a href="http://www.epa.gov/pesticides/regulating/tolerance_petitions.htm">http://www.epa.gov/pesticides/regulating/tolerance_petitions.htm</a> ) included with petitions (link to <a href="http://www.epa.gov/pesticides/regulating/tolerances.htm">http://www.epa.gov/pesticides/regulating/tolerances.htm</a> )			X
9	If applicable for conventional applications, reduced risk rationale (link to <a href="http://www.epa.gov/opprd001/workplan/reducedrisk.html">http://www.epa.gov/opprd001/workplan/reducedrisk.html</a> )			X
10	Required Data (link to <a href="http://www.epa.gov/pesticides/regulating/data_requirements.htm">http://www.epa.gov/pesticides/regulating/data_requirements.htm</a> ) and/or data waivers. See Footnote C.			
	a) List study (or studies) not included with application			

Comments:

- studies passed 8e-5  
- inerts approved by RD inert team (KP) 01-04-10

MRID 479415

\* N/A – Not Applicable

Footnotes

A. During the 21 day initial content review, all CSFs will be reviewed to determine whether all inerts listed, including fragrances, are approved for the proposed uses. If an unapproved inert is identified, the applicant must either 1) resolve the inert issue by, for example, removing the inert, substituting it with an approved inert, submitting documentation that EPA approved the inert for the proposed pesticidal uses, correcting mistakes on the CSF, etc. or 2) provide the data to support OPP approval of the inert or 3) withdraw the application. Removing or substituting an inert ingredient will require a new CSF and may require submission of data. All information, forms, data and documentation resolving the inert issue must have been received by the Agency or the application withdrawn within the 21 day period, otherwise, the Agency will reject the application as described below.

To successfully complete this aspect of the 21 day initial content screen, applicants are strongly encouraged to verify that all inert ingredients have been approved for the application's uses even if a product is currently registered by consulting the inert Web



site [link to <http://www.epa.gov/opprd001/inerts/lists.html>] and if the inert is not approved, to **obtain the necessary inert approval prior to submitting an application to register a pesticide product containing that inert ingredient.** Some inert ingredients are no longer approved for food uses or certain types of uses. The name and/or CAS number on a CSF must match the name and CAS number on this web site. Simple typographical errors in the name or CAS number have resulted in processing delays.

If an inert is not listed on the inert ingredient web site and the applicant believes that the inert has been approved, the applicant should contact the Inert Ingredient Assessment Branch (IIAB) at [inertsbranch@epa.gov](mailto:inertsbranch@epa.gov) and resolve the issue. Copies of the correspondence with IIAB resolving the issue should accompany the application. All new inerts except PIP inerts are reviewed by IIAB. The IIAB should also be contacted for any questions on what supporting data needs to be submitted for and the Agency's inert review process. Questions on PIP inerts should be directed to the Chief of Microbial Pesticides Branch [Link to [http://www.epa.gov/oppbppd1/biopesticides/contacts\\_bppd.htm](http://www.epa.gov/oppbppd1/biopesticides/contacts_bppd.htm)].

When a brand, trade, or proprietary name of an inert ingredient is listed on a CSF, additional information such as an alternate name of the inert, CAS number or other information [link to <http://www.epa.gov/opprd001/inerts/tips.pdf>] must also be included to enable the Agency to determine if it has been approved. Each component of an inert mixture (including a fragrance) must be identified. In some cases, the supplier of the mixture or fragrance may need to provide this information to the Agency. Prior to the Agency's receipt of an application, applicants must arrange with a proprietary mixture or fragrance supplier to provide the component information to the Agency or promptly upon EPA's request. If the inert ingredients in a proprietary blend (including fragrances) cannot or are not identified or provided within the 21-day content review period, the Agency will reject the application.

During the 21 day content review, applicants should submit information to the individual identified by the Agency when the applicant is informed of an unapproved inert.

### **Unapproved Inerts Identified on CSFs**

#### **All applications except conventional new products and PIPs**

Once an unapproved inert is identified on a CSF, the Agency will contact the applicant with the following options:

1. Correct the application by, for instance, correcting the inert's identity or CAS number, providing documentation that the inert has been approved, or removing the unapproved inert from the CSF or replacing it with one that is approved for the application's uses; or
2. Submit the information and data needed for the Agency to approve the unapproved inert. If this option is selected and implemented, the Agency may request an extension in the PRIA decision review timeframe to accommodate the inert review/approval process;

3. Withdraw the application (the Agency retains 25% of the full fee for the fee category estimated); or

If none of these options is selected and implemented by the applicant within the 21 day content review period, the Agency will reject the application and retain 25% of the full fee of the category identified.

#### Conventional New Product Applications

When the Registration Division identifies an unapproved inert on a CSF with an application for a new product that the applicant has not identified as requiring an inert approval (R311, R312 or R313), it will contact the applicant with the following options:

1. Correct the application by, for instance, correcting the inert's identity or CAS number, providing documentation that the inert has been approved, or removing the unapproved inert from the CSF or replacing it with one that is approved for the application's uses; or
2. Submit the information and data needed for the Agency to approve the unapproved inert, including any required petition to establish or amend a tolerance or exemption from a tolerance. (This option may change the PRIA category for the application, which could require a longer decision review time and a larger fee. If additional fees are due, they must be received by the Agency within the 21 day content review period.)
3. Withdraw the application (the Agency retains 25% of the full fee for the fee category estimated); or

If none of the above options is selected and implemented during the 21-day content-review period, the Agency will reject the application and retain 25% of the appropriate fee for the new product-inert approval category.

#### PIP Applications

When the Biopesticide and Pollution Prevention Division identifies an unapproved inert on a PIP CSF and a request to approve the inert does not accompany the application, it will contact the applicant with the following options:

1. Correct the application by, for instance, correcting the spelling or name of the inert to that in 40 CFR 174, or providing documentation that the inert has been approved; or
2. Submit the information and data needed for the Agency to approve the unapproved inert. If an inert ingredient tolerance exemption petition is required, the petition must be received by the Agency and the B903 fee paid within the 21 day period. If this option is selected and implemented, the Agency will discuss harmonizing the timeframe for both actions.

3. Withdraw the application (the Agency retains 25% of the full fee for the fee category estimated); or

If none of the above options is selected and implemented during the 21 day content review period, the Agency will reject the application and retain 25% of the fee.

B. A policy on documentation of offers to pay is still being developed, however, for a me-too or fast track (similar/identical) new product, R300 or A530, an application without the necessary authorizations of offers to pay will be placed into either R301 or A531. The Agency recommends that authorizations of offers to pay be submitted with other PRIA applications to avoid delays in the Agency's decision.

C. Biopesticide applicants are advised to contact the Agency and discuss study waivers prior to submitting their application to the Agency. Documentation of such discussions should be submitted with the study waiver.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

December 29, 2009

OFFICE OF  
PREVENTION, PESTICIDES AND  
TOXIC SUBSTANCES

OPP Decision Number: D-425342  
EPA File Symbol or Registration Number: 70506-EGN  
Product Name: UP-END HERBICIDE  
EPA Receipt Date: 22-Dec-2009  
EPA Company Number: 70506  
Company Name: UNITED PHOSPHORUS, INC

DAVE OLSON  
UNITED PHOSPHORUS, INC  
630 FREEDOM BUSINESS CENTER, SUITE 402  
KING OF PRUSSIA, PA 19406-

SUBJECT: Receipt of Registration Application Subject to Registration Service Fee

Dear Registrant:

The Office of Pesticide Programs has received your application and certification of payment. If you submitted data with this application, the results of the PRN-86-5 screen will be communicated separately. During the administrative screen, the Office of Pesticide Programs has determined that this Action is subject to a Pesticide Registration Service Fee as defined in the Pesticide Registration Improvement Act.

The Action has been identified as Action Code: R310

NEW PRODUCT;NON-FAST TRACK (INCLUDES REVIEWS OF PRODUCT  
CHEMISTRY;ACUTE TOXICITY;PUBLIC HEALTH PEST EFFICACY);

No additional payment is due at this time.

If you have any questions, please contact the Pesticide Registration Service Fee Ombudsman at (703) 305-6249.

Sincerely, *Teresa Downs*  
Front End Processing Staff  
Information Technology & Resources Management Division



## United Phosphorus, Inc.

630 Freedom Business Center  
Suite 402  
King of Prussia, PA 19406  
(610) 491-2828 (phone)  
(610) 491-2810 (fax)

Rebecca A. Clemmer  
Regulatory Manager

Jim Tompkins (PM 25)  
Document Processing Desk (REG)  
Office of Pesticide Programs (7504P)  
U.S. Environmental Protection Agency  
Room S-4900, One Potomac Yard  
2777 S. Crystal Drive  
Arlington, VA 22202

Dec. 22, 2009

Re: Application for registration: UP-End Herbicide

Dear Mr. Tompkins:

United Phosphorus, Inc. is applying for registration of UP-End Herbicide, manufactured from the unregistered technical UPI Pendimethalin Technical (application for registration dated 12/14/09; EPA File Symbol 70506-EEO)) for nonfood uses only. This label is a me-too of the BASF product Pendulum AquaCap (EPA Reg. No. 241-416).

In support of this application, enclosed please find the following:

- Application for Pesticide Registration (EPA Form 8570-1).
- Confidential Statement of Formula dated December 16, 2009.
- Data matrix forms - Agency Use and Public File copies (EPA Form 8570-35).
- Five (5) copies of the proposed labeling.
- EPA form 8570-34, Certification with Respect to Offers to Pay, using the selective cite-all method to satisfy data requirements other than product specific data.
- Copy of the letter accompanying payment of the PRIA fee.
- Transmittal document.
- Three (3) copies of reports for product specific data listed in the attached Transmittal Document.

This action should fall within the PRIA category R310 "New end-use or manufacturing-use product, requires review of data package within RD" with a PRIA fee of \$4578.

Please contact me if you have any questions.

Very truly yours,

Rebecca A. Clemmer  
[rebecca.clemmer@uniphos.com](mailto:rebecca.clemmer@uniphos.com)

## TRANSMITTAL DOCUMENT

### Submitter

United Phosphorus, Inc.  
630 Freedom Business Center, Suite 402, King of Prussia, PA 19406  
Company Number 70506

### Regulatory action in support of which this package is submitted

Application for Registration of UP-End Herbicide

Transmittal Date: December 22, 2009

<u>Submitted Studies</u>		
MRID	Title	Guideline
47941501	UP-End Herbicide -- Product Identity, Composition, and Analysis. United Phosphorus, Inc. December 22, 2009. UPI Report Number UPI-2009-008. 53 p.	Series 830
47941502	UP-End Herbicide -- Physical/Chemical Properties. United Phosphorus, Inc. December 14, 2009. UPI Compilation Report No. UPI-2009-009 105 p.	Series 830
47941503	Validation of Analytical Method for Active Ingredient Analysis of Pendimethalin CS Herbicide by HPLC. Jai Research Foundation, Oct. 3, 2009. JRF Study 9196, 46 p.	830.1700 830.1800
47941504	Acute Oral Toxicity Study of Pendimethalin CS Herbicide in Rats. Jai Research Foundation, Oct. 22, 2009. JRF Study 9172. 39 p.	870.1100
47941505	Acute Dermal Toxicity Study of Pendimethalin CS Herbicide in Rats. Jai Research Foundation, Oct. 21, 2009. JRF Study 9173. 42 p.	870.1200
47941506	Acute Inhalation Toxicity Study of Pendimethalin CS Herbicide in Rats. Jai Research Foundation, Oct. 29, 2009. JRF Study 9174. 55 p.	870.1300
47941507	Acute Eye Irritation Study of Pendimethalin CS Herbicide in Rabbits. Jai Research Foundation, Oct. 22, 2009. JRF Study 9176. 39 p.	870.2400
47941508	Acute Dermal Toxicity Study of Pendimethalin CS Herbicide. Jai Research Foundation, Oct. 12, 2009. JRF Study 9175. 39 p.	870.2500
47941509	Skin Sensitization Study of Pendimethalin CS Herbicide in Guinea Pigs (Guinea Pig Maximization Test). Jai Research Foundation, Oct. 29, 2009. JRF Study 9177. 57 p.	870.2600

# Fee for Service

JK  
{864630E~

This package includes the following

- ☒ New Registration
- ☐ Amendment

☒ Studies? ☐ Fee Waiver?

☐ volpay ☒ % Reduction: \_\_\_\_

for Division

- ☐ AD
- ☐ BPPD
- ☒ RD

Risk Mgr.

25

Receipt No.

S-

864630

EPA File Symbol/Reg. No.

70506-EGN

Pin-Punch Date:

12/22/2009

☐ This item is NOT subject to FFS action.

## Action Code:

Requested:

R310

Granted:

R310

Amount Due: \$ 4,578.<sup>00</sup>

Inerts approved. S. Lock 12/30/09

## Parent/Child Decisions:

☒ Inert Cleared for Intended Use



Uncleared Inert in Product

Reviewer:

He Bo Di

Date: 12-29-09

Remarks:

# Receipt for Section 3

S: 864630

Resubmission: ☐ Yes ☒ No

Regulatory Type: Product Registration - Section 3

Fee For Service: ☒ Yes ☐ No

Application Type: New Registration

Billable: ☒ Yes ☐ No

Company: 70506 UNITED PHOSPHORUS, INC V

Print Letter

Enter More Information

Tracking



Risk Manager: Registration Division, Risk Management Team 25

Product #: 70506-EGN Product Name: UP-END HERBICIDE

Override#:

Me Too Section3: 241-416 Me Too Product Name: PENDULUM CS HERBICIDE

Application Date: 22-Dec-2009  OPP Rec'd Date: 22-Dec-2009 

Front End Date: 29-Dec-2009  Risk Manager Send Date: 

FFS Due Date: Negotiated Due Date:

OPP Target Date:

Fast Track: ☐ New Ingredient: ☐

Receipt Description:

Application for registration

New Ingredient Request Date:

New Ingredient Received Date:

Form A: ☐ Signature Date:

Form B: ☐ Signature Date:

Receipt Content	
Study	
CSF	

View/Edit





## United Phosphorus, Inc.

633 Freedom Business Center  
Suite 402  
King of Prussia, PA 19406  
(610) 491-2828 (phone)  
(610) 491-2810 (fax)

Rebecca A. Clemmer  
Regulatory Manager

Dec. 11, 2009

U.S. Environmental Protection Agency  
Government Lockbox 979074  
1005 Convention Plaza  
SL-MO-C2-GL  
St. Louis, MO 63197

Re: Payment of PRIA Fee

To Whom It May Concern:

Enclosed please find a check for \$4,578.00 in advance payment of the PRIA fee for the application for registration of an end-use product containing pendimethalin. The Company Number is 70506.

Please contact me by telephone or at the email address below if you have any questions.

Very truly yours,

A handwritten signature in cursive script that reads 'R.A. Clemmer'.

Rebecca A. Clemmer  
[rebecca.clemmer@uniphos.com](mailto:rebecca.clemmer@uniphos.com)

UNITED PHOSPHORUS INC 12057		Telephone 1-610-491-2875 SAP		NET 4,578.00
Paid To: ENVIRONMENTAL PROTECTION AGENCY				CHECK DATE 11/18/2009
				CHECK NO. 000010850
INVOICE NUMBER	DOCUMENT NUMBER	AMOUNT	DISCOUNT	NET
PRIA FEE	0026252795	4,578.00	0.00	4,578.00
TOTALS		4,578.00	0.00	4,578.00

MESSAGES
PRIA Fee

THE FACE OF THIS DOCUMENT CONTAINS SECURITY PRINTING. THE BACK OF THIS DOCUMENT FEATURES SECURITY PRINTING-HOLD AT AN ANGLE TO VIEW.

UNITED PHOSPHORUS INC  
630 Freedom Business Ctr. Ste 402 King of Prussia, PA 19406  
Telephone 1-610-491-2875 SAP

JP Morgan Chase Bank 50-937  
6040 Tarbell Rd. 213  
Syracuse, N.Y. 13206

CHECK NO. 000010850  
11/18/2009

PAY: Four Thousand Five Hundred Seventy-Eight And No/100 Dollars

TO THE ORDER OF: ENVIRONMENTAL PROTECTION AGENCY  
PESTICIDE MAINTENANCE FEES  
P.O. Box 979031  
ST. LOUIS, MO 63197-9000

PAY THIS AMOUNT  
\$\*\*\*\*\*4,578.00

Not Valid After 180 Days

*EWC*  
Financial Officer



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
**1200 Pennsylvania Avenue, N.W.**  
**WASHINGTON, D.C. 20460**

Paperwork Reduction Act Notice: The public reporting burden for this collection of information is estimated to average 1.25 hours per response for registration and 0.25 hour per response for reregistration and special review activities, including time for reviewing the instructions and completing the necessary forms. Send comments regarding burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden to: Director, Collection Strategies Division (2822T), U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, N.W., Washington, DC 20460. Do not send the completed form to this address.

**Certification with Respect to Citation of Data**

Applicant's/Registrant's Name, Address, and Telephone Number United Phosphorus, Inc., 630 Freedom Business Ctr, King of Prussia PA 19406 Tel: 610-491-2828	EPA Registration Number/File Symbol 70506-
Active Ingredient(s) and/or representative test compound(s) Pendimethalin	Date December 22, 2009
General Use Pattern(s) (list all those claimed for this product using 40 CFR Part 158) Non-food crops only	Product Name UP-End Herbicide

**NDTE:** If your product is a 100% repackaging of another purchased EPA-registered product labeled for all the same uses on your label, you do not need to submit this form. You must submit the Formulator's Exemption Statement (EPA Form 8570-27).

☐ I am responding to a Data-Call-In Notice, and have included with this form a list of companies sent offers of compensation (the Data Matrix form should be used for this purpose).

**SECTION I: METHOD OF DATA SUPPORT (Check one method only)**

<input type="checkbox"/> I am using the cite-all method of support, and have included with this form a list of companies sent offers of compensation (the Data Matrix form should be used for this purpose).	<input checked="" type="checkbox"/> I am using the selective method of support (or cite-all option under the selective method), and have included with this form a completed list of data requirements (the Data Matrix form must be used).
--	---

**SECTION II: GENERAL OFFER TO PAY**

[Required if using the cite-all method or when using the cite-all option under the selective method to satisfy one or more data requirements]

☒ I hereby offer and agree to pay compensation, to other persons, with regard to the approval of this application, to the extent required by FIFRA.

**SECTION III: CERTIFICATION**

I certify that this application for registration, this form for reregistration, or this Data-Call-In response is supported by all data submitted or cited in the application for registration, the form for reregistration, or the Data-Call-In response. In addition, if the cite-all option or cite-all option under the selective method is indicated in Section I, this application is supported by all data in the Agency's files that (1) concern the properties or effects of this product or an identical or substantially similar product, or one or more of the ingredients in this product; and (2) is a type of data that would be required to be submitted under the data requirements in effect on the date of approval of this application if the application sought the initial registration of a product of identical or similar composition and uses.

I certify that for each exclusive use study cited in support of this registration or reregistration, that I am the original data submitter or that I have obtained the written permission of the original data submitter to cite that study.

I certify that for each study cited in support of this registration or reregistration that is not an exclusive use study, either: (a) I am the original data submitter; (b) I have obtained the permission of the original data submitter to use the study in support of this application; (c) all periods of eligibility for compensation have expired for the study; (d) the study is in the public literature; or (e) I have notified in writing the company that submitted the study and have offered (i) to pay compensation to the extent required by sections 3(c)(1)(F) and/or 3(c)(2)(B) of FIFRA; and (ii) to commence negotiations to determine the amount and terms of compensation, if any, to be paid for the use of the study.

I certify that in all instances where an offer of compensation is required, copies of all offers to pay compensation and evidence of their delivery in accordance with sections 3(c)(1)(F) and/or 3(c)(2)(B) of FIFRA are available and will be submitted to the Agency upon request. Should I fail to produce such evidence to the Agency upon request, I understand that the Agency may initiate action to deny, cancel or suspend the registration of my product in conformity with FIFRA.

I certify that the statements I have made on this form and all attachments to it are true, accurate, and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law.

Signature <i>R. A. Clemmer</i>	Date 12/22/09	Typed or Printed Name and Title Rebecca A. Clemmer/Regulatory Manager
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## United Phosphorus, Inc.

630 Freedom Business Center  
Suite 402  
King of Prussia, PA 19406  
(610) 491-2828 (phone)  
(610) 491-2810 (fax)

Rebecca A. Clemmer  
Regulatory Manager

Jim Tompkins (PM 25)  
Document Processing Desk (REG)  
Office of Pesticide Programs (7504P)  
U.S. Environmental Protection Agency  
Room S-4900, One Potomac Yard  
2777 S. Crystal Drive  
Arlington, VA 22202

Dec. 22, 2009

Re: Application for registration: UP-End Herbicide

Dear Mr. Tompkins:

United Phosphorus, Inc. is applying for registration of UP-End Herbicide, manufactured from the unregistered technical UPI Pendimethalin Technical (application for registration dated 12/14/09; EPA File Symbol 70506-EEO)) for nonfood uses only. This label is a me-too of the BASF product Pendulum AquaCap (EPA Reg. No. 241-416).


In support of this application, enclosed please find the following:

- Application for Pesticide Registration (EPA Form 8570-1).
- Confidential Statement of Formula dated December 16, 2009.
- Data matrix forms - Agency Use and Public File copies (EPA Form 8570-35).
- Five (5) copies of the proposed labeling.
- EPA form 8570-34, Certification with Respect to Offers to Pay, using the selective cite-all method to satisfy data requirements other than product specific data.
- Copy of the letter accompanying payment of the PRIA fee.
- Transmittal document.
- Three (3) copies of reports for product specific data listed in the attached Transmittal Document.

This action should fall within the PRIA category R310 "New end-use or manufacturing-use product, requires review of data package within RD" with a PRIA fee of \$4578.

Please contact me if you have any questions.

Very truly yours,

  
Rebecca A. Clemmer  
[rebecca.clemmer@uniphos.com](mailto:rebecca.clemmer@uniphos.com)

## TRANSMITTAL DOCUMENT

### Submitter

United Phosphorus, Inc.  
630 Freedom Business Center, Suite 402, King of Prussia, PA 19406  
Company Number 70506

### Regulatory action in support of which this package is submitted



Application for Registration of UP-End Herbicide

Transmittal Date: December 22, 2009

### Submitted Studies

MRID	Title	Guideline
	UP-End Herbicide – Product Identity, Composition, and Analysis. United Phosphorus, Inc. December 22, 2009. UPI Report Number UPI-2009-008. 53 p.	Series 830
	UP-End Herbicide – Physical/Chemical Properties. United Phosphorus, Inc. December 14, 2009. UPI Compilation Report No. UPI-2009-009 105 p.	Series 830
479415-03	Validation of Analytical Method for Active Ingredient Analysis of Pendimethalin CS Herbicide by HPLC. Jai Research Foundation, Oct. 3, 2009. JRF Study 9196, 46 p.	830.1700 830.1800
	Acute Oral Toxicity Study of Pendimethalin CS Herbicide in Rats. Jai Research Foundation, Oct. 22, 2009. JRF Study 9172. 39 p.	870.1100
	Acute Dermal Toxicity Study of Pendimethalin CS Herbicide in Rats. Jai Research Foundation, Oct. 21, 2009. JRF Study 9173. 42 p.	870.1200
	Acute Inhalation Toxicity Study of Pendimethalin CS Herbicide in Rats. Jai Research Foundation, Oct. 29, 2009. JRF Study 9174. 55 p.	870.1300
	Acute Eye Irritation Study of Pendimethalin CS Herbicide in Rabbits. Jai Research Foundation, Oct. 22, 2009. JRF Study 9176. 39 p.	870.2400
	Acute Dermal Toxicity Study of Pendimethalin CS Herbicide. Jai Research Foundation, Oct. 12, 2009. JRF Study 9175. 39 p.	870.2500
	Skin Sensitization Study of Pendimethalin CS Herbicide in Guinea Pigs (Guinea Pig Maximization Test). Jai Research Foundation, Oct. 29, 2009. JRF Study 9177. 57 p.	870.2600

Form approved. OMB No. 2070-0060, 2070-0057, 2070-0107, 2070-0122, 2070-0164.

 <div style="text-align: center;"> <p>United States  <b>Environmental Protection Agency</b>              Washington, DC 20460</p> <p><b>Formulator's Exemption Statement</b>  <i>(40 CFR 152.85)</i></p> </div>		
<p>Applicant's Name and Address</p> <p>United Phosphorus, Inc.              630 Freedom Business Center              King of Prussia, PA 19406</p>	<p>EPA File Symbol/Registration Number  <b>70506-EGN</b></p> <hr/> <p>Product Name  <b>UP-End Herbicide</b></p> <hr/> <p>Date of Confidential Statement of Formula (EPA Form 8570-4)  <b>07/12/2010</b></p>	
<p>As an authorized representative of the applicant for registration of the product identified above, I certify that:</p> <p>(1) This product contains the following active ingredient(s):</p> <p style="margin-left: 40px;"><b>Pendimethalin</b></p> <p>(2) Of these, each active ingredient listed in paragraph (4) is present solely as the result of the use of that active ingredient in the manufacturing, formulation or repackaging another product which contains that active ingredient which is registered under FIFRA Section 3, is purchased by us from another person and meets the requirements of 40 CFR section 158.50(e)(2) or (3).</p> <p>(3) Indicate by checking (A) or (B) below which paragraph applies:</p> <p><input checked="" type="checkbox"/> (A) An accurate Confidential Statement of Formula (EPA FORM 8570-4) for the above identified product is attached to this statement. That formula statement indicates, by company name, registration number, and product name, the source of the active ingredient(s) listed in paragraph (1).</p> <p style="text-align: center;">OR</p> <p><input type="checkbox"/> (B) The Confidential Statement of Formula (CSF)(EPA Form 8570-4) referenced above and on file with the EPA is complete, current, an accurate and contains the information required on the current CSF.</p> <p>(4) The following active ingredients in this product qualify for the formulator's exemption.</p>		
<p><b>Source</b></p>		
<p>Active Ingredient</p> <p><b>Pendimethalin</b></p>	<p>Product Name</p> <div style="background-color: black; width: 100px; height: 30px; margin: 0 auto;"></div>	<p>Registration Number</p> <div style="background-color: black; width: 100px; height: 30px; margin: 0 auto;"></div>
<p>Signature</p> 	<p>Name and Title</p> <p><b>Rebecca A. Clemmer/Regulatory</b></p>	<p>Date</p> <p><b>07/12/2010</b></p>

EPA Form 8570-27 (Rev. 06-2004)

Copy 1 - EPA  
 Copy 2 - Applicant copy



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
401 M Street, S.W.  
WASHINGTON, D.C. 20460

**Paperwork Reduction Act Notice:** The public reporting burden for this collection of information is estimated to average 0.25 hours per response for registration activities and 0.25 hours per response for reregistration and special review activities, including time for reading the instruction and completing the necessary forms. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden to: Director, OPPE Information Management Division (2137), U.S. Environmental Protection Agency, 401 M Street, S.W., Washington DC 20460. Do not send the form to this address.

**DATA MATRIX**

Date: Dec. 22, 2009	EPA Reg No./ File Symbol: 70506-	Page 1 of 3
Applicant's/Registrant's Name and Address: United Phosphorus, Inc. 630 Freedom Business Center King of Prussia, PA 19406		Product: UP-End Herbicide
Ingredient: Pendimethalin		

Guideline Reference Number	Guideline Study Name	MRID Number	Submitter	Status	Note
<b>PRODUCT SPECIFIC</b>					
830.1550	Product identity and composition	UPI-2009-008	UPI	OWN	
830.1600	Description of Materials Used to Produce the Product	UPI-2009-008	UPI	OWN	
830.1650	Description of the Formulation Process	UPI-2009-008	UPI	OWN	
830.1670	Discussion of Formation of Impurities	UPI-2009-008	UPI	OWN	
830.1750	Certified Limits	UPI-2009-008	UPI	OWN	
830.1800	Enforcement Analytical Method	JRF 9196	UPI	OWN	
830.6302	Color	UPI-2009-009	UPI	OWN	
830.6303	Physical State	UPI-2009-009	UPI	OWN	
830.6304	Odor	UPI-2009-009	UPI	OWN	
830.6314	Oxidation/Reduction: Chemical Incompatibility			Not required	Does not contain oxidizing or reducing agents.
830.6315	Flammability			Not required	Does not contain combustible liquids.
830.6316	Explosibility			Not required	Not potentially explosive.
830.6317	Storage Stability	UPI-2009-009	UPI	OWN	
830.6319	Miscibility			Not required	Not diluted with petroleum solvents.
830.6320	Corrosion Characteristics	UPI-2009-009	UPI	OWN	

Signature <i>R. A. Clemmer</i>	Name and Title Rebecca A. Clemmer, Regulatory Manager	Date 12/22/09
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## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

401 M Street, S.W.

WASHINGTON, D.C. 20460

Form Approved OMB No. 2070-0060

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## DATA MATRIX

Date: Dec. 22, 2009	EPA Reg No./ File Symbol: 70506-	Page 2 of 3
Applicant's/Registrant's Name and Address: United Phosphorus, Inc. 630 Freedom Business Center King of Prussia, PA 19406	Product: UP-End Herbicide	
Ingredient: Pendimethalin		

Guideline Reference Number	Guideline Study Name	MRID Number	Submitter	Status	Note
830.6321	Dielectric Breakdown Voltage			Not required	Not used around electrical equipment.
830.7000	pH	UPI-2009-009	UPI	OWN	
830.7100	Viscosity	UPI-2009-009	UPI	OWN	
830.7300	Density/Relative Density/Bulk Density	UPI-2009-009	UPI	OWN	
870.1100	Acute oral toxicity – rat	JRF 9172	UPI	OWN	
870.1200	Acute dermal toxicity – rat	JRF 9173	UPI	OWN	
870.1300	Acute inhalation toxicity – rat	JRF 9174	UPI	OWN	
870.2400	Eye irritation	JRF 9176	UPI	OWN	
870.2500	Skin irritation	JRF 9175	UPI	OWN	
870.2600	Skin sensitization	JRF 9177	UPI	OWN	
GENERIC DATA		CITE ALL	BASF Corp., FMC Corp., Scotts Company, Southern States Cooperative, The Andersons, Lesco Inc., Drexel Chemical, Loveland Products, Harrell's LLC, Control Solutions, Cedar Chemical, Scotts-Sierra Crop Protection, Residential Exposure JV, Ag Handlers Exposure TF	PAY	Note: UPI is a member of the Spray Drift Task Force, the Agricultural Reentry Task Force, the Generic Endangered Species Task Force, and the Outdoor Residential Exposure Task Force.

Signature <i>R. A. Clemmer</i>	Name and Title Rebecca A. Clemmer, Regulatory Manager	Date 12/22/09
-----------------------------------	--	------------------





## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

401 M Street, S.W.

WASHINGTON, D.C. 20460

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## DATA MATRIX

Date: Dec. 22, 2009	EPA Reg No./ File Symbol: 70506-	Page 1 of 3
Applicant's/Registrant's Name and Address: United Phosphorus, Inc. 630 Freedom Business Center King of Prussia, PA 19406	Product: UP-End Herbicide	
Ingredient: Pendimethalin		

Guideline Reference Number	Guideline Study Name	MRID Number	Submitter	Status	Note
PRODUCT SPECIFIC					
				OWN	
				OWN	
				OWN	
				OWN	
				OWN	
				OWN	
				OWN	
				OWN	
				OWN	
				Not required	Does not contain oxidizing or reducing agents.
				Not required	Does not contain combustible liquids.
				Not required	Not potentially explosive.
				OWN	
				Not required	Not diluted with petroleum solvents.
				OWN	
				Not required	Not used around electrical equipment.

Signature <i>R. A. Clemmer</i>	Name and Title Rebecca A. Clemmer, Regulatory Manager	Date 12/22/09
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## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

401 M Street, S.W.

WASHINGTON, D.C. 20460

**Paperwork Reduction Act Notice:** The public reporting burden for this collection of information is estimated to average 0.25 hours per response for registration activities and 0.25 hours per response for reregistration and special review activities, including time for reading the instruction and completing the necessary forms. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden to: Director, OPPE Information Management Division (2137), U.S. Environmental Protection Agency, 401 M Street, S.W., Washington DC 20460. Do not send the form to this address.

## DATA MATRIX

Date: Dec. 22, 2009	EPA Reg No./ File Symbol: 70506-	Page 2 of 3
Applicant's/Registrant's Name and Address: United Phosphorus, Inc. 630 Freedom Business Center King of Prussia, PA 19406	Product: UP-End Herbicide	
Ingredient: Pendimethalin		

Guideline Reference Number	Guideline Study Name	MRID Number	Submitter	Status	Note
				OWN	
				OWN	
				OWN	
				OWN	
				OWN	
				OWN	
				OWN	
				OWN	
				OWN	
GENERIC DATA					
				PAY	Note: UPI is a member of the Spray Drift Task Force, the Agricultural Reentry Task Force, the Generic Endangered Species Task Force, and the Outdoor Residential Exposure Task Force.

Signature

R. A. Clemmer

Name and Title

Rebecca A. Clemmer, Regulatory Manager

Date

12/22/09

**FOR OFFICIAL USE ONLY**

FILE SYMBOL
REGISTRATION NO. 70506-EGN

**CONFIDENTIAL STATEMENT OF FORMULA ENCLOSED**

DATE SUBMITTED	SUBMITTED BY (✓)	
	APPLICANT	BASIC SUPPLIER
DEC 22 2009		

**Do Not Write Comments,  
Formula, or Parts of Formula  
on This Envelope**

**NOTE**

It shall be unlawful—for any person to use for his own advantage or to reveal, other than to the Secretary, or officials or employees of the United States Department of Agriculture or other Federal agencies, or to the courts in response to a subpoena, or to physicians, and in emergencies to pharmacists and other qualified persons, for use in the preparation of antidotes, in accordance with such directions as the Secretary may prescribe, any information relative to formulas of products acquired by authority of Section 4 of the "Federal Insecticide, Fungicide, and Rodenticide Act."

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Page    is not included in this copy.

Pages  80  through  92  are not included in this copy.

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The material not included contains the following type of information:

       Identity of product inert ingredients.

       Identity of product impurities.

       Description of the product manufacturing process.

       Description of quality control procedures.

       Identity of the source of product ingredients.

       Sales or other commercial/financial information.

       A draft product label.

  X   The product confidential statement of formula.

       Information about a pending registration action.

       FIFRA registration data.

       The document is a duplicate of page(s)       .

       The document is not responsive to the request.

       Proprietary information pertaining to the chemical composition of an inert ingredient provided by the source of the ingredient.

       Attorney-Client Privilege.

       Claimed Confidential by submitter upon submission to the Agency.

       Internal Deliberative Information.

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\* The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

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